ORDER NO. SD7903–1544

Service Manual

SU-8099/K

Stereo Integrated Amplifier

SU-8099

(D), (DG), (EB), (XSW), (XGF), (XGH)

SU-8099K

(D), (DG), (EB), (XSW), (XE), (X), (XA), (XGH)

SU-8099

SU-8099K

- * The models SU-8099 (D, DG) and SU-8099K (D, DG) are available in Scandinavia and European only.
- * The models SU-8099 (EB) and SU-8099K (EB) are available in Belgium only.
- * The models SU-8099 (XSW) and SU-8099K (XSW) are available in Switzerland only.
- * The model SU-8099 (XGF) is available in France only.
- * The model SU-8099K (XE) is available in United Kingdom only.
- * The models SU-8099K (X, XA) are available in Asia, Latin America, Middle East and Africa only.
- * The models SU-8099 (XGH) and SU-8099K (XGH) are available in Holland only.

TECHNICAL SPECIFICATIONS

Specifications are subject to change without notice for further improvement.

[DIN 45 500]

AMPLIFIER SECTION

20Hz ~ 20kHz continuous power output	
both channels driven	2 x 120 W (4Ω), 2 x 115W (8Ω)
40 Hz ~ 16 kHz continuous power output	
both channels driven	2 x 120 W (4Ω), 2 x 115 W (8Ω)
1 kHz continuous power output	
both channels driven	2 x 125 W (4Ω), 2 x 120 W (8Ω)
Power bandwidth both channels driven, –3 dB	THD 0.01% 5Hz ~ 30 kHz (4Ω) THD 0.007% 5Hz ~ 40 kHz (8Ω) THD 0.03% 5 Hz ~ 100 kHz (8Ω)
Total harmonic distortion	
rated power at 20 Hz ~ 20 kHz	0.01% (4Ω), 0.007% (8Ω)
rated power at 40 Hz ~ 16 kHz	0.01% (4Ω), 0.007% (8Ω)
rated power at 1 kHz	0.007% (4Ω), 0.007% (8Ω)
half power at 20 Hz ~ 20 kHz	**(distortion)** 0.005% (8Ω) **(distortion + noise)** 0.007% (8Ω)
half power at 1 kHz	**(distortion)** 0.0005%(8Ω) **(distortion + noise)** 0.006% (8Ω)
–26 dB power at 1 kHz	**(distortion)** 0.005% (4Ω), **(distortion + noise)** 0.06%(4Ω)
50 mW power at 1 kHz	**(distortion)** 0.007% (4Ω), **(distortion + noise)** 0.1% (4Ω)
Intermodulation distortion	
rated power at 250 Hz : 8 kHz = 4 : 1,4Ω	0.01%
rated power at 60 Hz : 7 kHz = 4 : 1, SMPTE, 8Ω	0.007%
Residual hum & noise (Straight DC)	0.3 mV (0.3 mV, IHF A)
Damping factor	50 (4Ω), 100 (8Ω)
Input sensitivity and impedance	
PHONO 1, 2 MM	2.5 mV/47 kΩ
PHONO 1 MC	100μV/47Ω
TUNER, AUX	200 mV/47 kΩ
TAPE 1, 2 (PLAYBACK), REC/PLAY	200 mV/47 kΩ
MAIN IN	1V/18 kΩ
PHONO maximum input voltage (1 kHz, RMS) MM	250 mV
MC	10 mV
S/N rated power at 4Ω	
PHONO 1, 2 MM	75 dB (90 dB, IHF A)
PHONO 1 MC	70 dB (80 dB, IHF A)
TUNER, AUX	90 dB (110 dB, IHF A)
–26 dB power at 4Ω	
PHONO 1, 2 MM, PHONO 1 MC	67 dB
TUNER, AUX	68 dB
50 mW power at 4Ω	
PHONO 1, 2 MM, PHONO 1 MC	60 dB
TUNER, AUX	60 dB
Frequency response PHONO	RIAA standard curve 30 Hz ~ 15 kHz, ±0.15 dB
TUNER, AUX, TAPE (Straight DC)	20 Hz ~ 20 kHz, $^{+0}_{-0.1}$ dB 0 Hz ~ 130 kHz, –1 dB
Tone controls BASS	50 Hz, +7.5 dB ~ –7.5 dB
TREBLE	20 kHz, +7.5 dB ~ –7.5 dB
Turnover frequency BASS	125 Hz, 250 Hz, 500 Hz
TREBLE	2 kHz, 4 kHz, 8 kHz
High filter	7 kHz, –6 dB/oct.
Equalizer subsonic filter	20 Hz, –12 dB/oct.
Loudness switch (volume at –30 dB)	50 Hz, +7.5 dB
Output voltage and impedance PRE OUT	rated 1V, max. 7V
REC OUT	200 mV
REC/PLAY	30 mV/82 kΩ
Channel balance (250 Hz ~ 6300 Hz), AUX	±0.5 dB
Channel separation at 1 kHz, AUX	60 dB
Headphones output level and impedance	600 mV/390Ω
Load impedance MAIN or REMOTE	4 ~ 16Ω
MAIN + REMOTE	8 ~ 16Ω

GENERAL

Power consumption	1160 W
Power supply (50 Hz/60 Hz)	110V/120V/220V/240V
Dimensions (W x H x D)	450 x 142 x 420 mm (17-23/32" x 5-19/32" x 16-17/32")
Weight	20 kg (44.1 lb.)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

TECHNISCHE DATEN [DIN 45 500]

Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.

VERSTÄRKERTEIL

Dauertonleistung bei 20 Hz ∼ 20 kHz beide Kanäle zusammen ausgesteuert	2 x 120 W (4Ω) 2 x 115 W (8Ω)
Dauertonleistung bei 40 Hz ∼ 16 kHz beide Kanäle zusammen ausgesteuert	2 x 120 W (4Ω) 2 x 115 W (8Ω)
Dauertonleistung bei 1 kHz beide Kanäle zusammen ausgesteuert	2 x 125 W (4Ω) 2 x 120 W (8Ω)
Leistungsbandbreite beide Kanäle zusammen ausgesteuert, −3 dB	
Klirrfaktor 0,01%	5 Hz ∼ 30 kHz (4Ω)
Klirrfaktor 0,007%	5 Hz ∼ 40 kHz (8Ω)
Klirrfaktor 0,03%	5 Hz ∼ 100 kHz (8Ω)
Klirrfaktor	
Nennleistung bei 20 Hz ∼ 20 kHz	0,01% (4Ω), 0,007% (8Ω)
Nennleistung bei 40 Hz ∼ 16 kHz	0,01% (4Ω), 0,007% (8Ω)
Nennleistung bei 1 kHz	0,007% (4Ω), 0,007% (8Ω)
halbe Nennleistung bei 20 Hz ∼ 20 kHz	
(Klirrfaktor)	0,005% (8Ω),
(Klirrfaktor + Rauschen)	0,007% (8Ω)
halbe Nennleistung bei 1 kHz	
(Klirrfaktor)	0,0005% (8Ω),
(Klirrfaktor + Rauschen)	0,006% (8Ω)
−26 dB Leistung bei 1 kHz	
(Klirrfaktor)	0,005% (4Ω),
(Klirrfaktor + Rauschen)	0,06% (4Ω)
50 mW Leistung bei 1 kHz	
(Klirrfaktor)	0,007% (4Ω),
(Klirrfaktor + Rauschen)	0,1% (4Ω)
Intermodulationsverzerrung	
Nennausgangsleistung bei 250 Hz: 8kHz = 4:1, 4Ω	0,01%
Nennausgangsleistung bei 60Hz: 7 kHz = 4:1, SMPTE 8Ω	0,007%
Brummen & Rauschen	0,3 mV (0,3 mV, IHF A)
Dämpfungsfaktor	50 (4Ω), 100 (8Ω)
Eingangsempfindlichkeit & Impedanz	
PHONO 1, 2 MM	2,5 mV/47 kΩ
PHONO 1 MC	100μV/47Ω
TUNER, AUX, TAPE 1, 2, REC/PLAY	200 mV/47 kΩ
MAIN IN	1V/18kΩ

PHONO Maximale Eingangsspannungen, 1 kHz	**MM**	250 mV
	MC	10 mV
Frequenzang	**PHONO**	RIAA Standardkurve 30 Hz ∼ 15 kHz, ±0,15 dB
	TUNER, AUX, TAPE (Straight DC)	0 Hz ∼ 130 kHz, −1 dB 20 Hz ∼ 20 kHz, $^{+0}_{-0,1}$ dB
Fremdspannungsabstand Nennausgangsleistung bei 4Ω		
	PHONO 1, 2 MM	75 dB (90 dB, IHF A)
	PHONO 1 MC	70 dB (80 dB, IHF A)
	TUNER, AUX	90 dB (110 dB, IHF A)
−26 dB Ausgangsleistung bei 4Ω	**PHONO MM, MC**	67 dB
	TUNER, AUX	68 dB
50mW Ausgangsleistung bei 4Ω	**PHONO MM, MC**	60 dB
	TUNER, AUX	60 dB
Klangregler	**BÄSSE**	50 Hz, +7,5 dB ∼ −7,5 dB
	HÖHEN	20 kHz, +7,5 dB ∼ −7,5 dB
Ubergangsfrequenz	**BÄSSE**	125Hz, 250 Hz, 500 Hz
	HÖHEN	2kHz, 4 kHz, 8 kHz
Höhenfilter (HIGH)		7 kHz, −6 dB/oct.
Unterschallfilter		20 Hz, −12 dB/oct.
Gehörgerechte Lautstärkekorrektur (Lautstärke bei −30 dB)		50 Hz, +7,5 dB
Ausgangsspannungen & Impedanz	**PRE OUT** Nennleistung	1V, max. 7V
	REC OUT	200 mV
	REC/PLAY	30 mV/82 kΩ
Kanalabweichung (250 Hz ∼ 6300 Hz), AUX		±0,5 dB
Kanaltrennung bei 1 kHz, AUX		60 dB
Köpfhörerpegel und Ausgangsimpedanz		600 mV/390Ω
Lautsprecher-Ausgangsimpedanz		
	MAIN oder REMOTE	4 ∼ 16Ω
	MAIN und REMOTE	8 ∼ 16Ω

ALLGEMEINE DATEN

Leistungsaufnahme	1160 W
Netzspannung umschaltbar (50 Hz/60Hz)	110V/120V/220V/240V
Abmessungen (B x H x T)	450 x 142 x 420 mm
Gewicht	20 kg

CARACTERISTIQUES TECHIQUES [DIN 45 500]

Sujet à changement sans préaris.

PARTIE AMPLIFICATEUR

Puissance (continue) à 20 Hz ∼ 20 kHz pour l’ensemble des canaux excités	2 x 120 W (4Ω) 2 x 115 W (8Ω)
Puissance (continue) à 40 Hz ∼ 16 kHz pour l’ensemble des canaux excités	2 x 120 W (4Ω) 2 x 115 W (8Ω)
Puissance (continue) à 1 kHz pour l’ensemble des canaux excités	2 x 125 W (4Ω) 2 x 120 W (8Ω)
Largeur de bande de puissance pour l’ensemble des canaux excités, −3 dB	
DHT 0,01%	5 Hz ∼ 30 kHz (4Ω)
DHT 0,007%	5 Hz ∼ 40 kHz (8Ω)
DHT 0,03%	5 Hz ∼ 100 kHz (8Ω)
Distorsion harmonique totale	
à puissance nominale (20 Hz ∼ 20 kHz)	0,01% (4Ω), 0,007% (8Ω)
à puissance nominale (40 Hz ∼ 16 kHz)	0,01% (4Ω), 0,007% (8Ω)
à puissance nominale (1 kHz)	0,007% (4Ω), 0,007% (8Ω)
à demi-puissance (20 Hz ∼ 20 kHz)	
(distorsion)	0,005% (8Ω),
(distorsion + bruit)	0,007% (8Ω)
à demi-puissance (1 kHz)	
(distorsion)	0,0005% (8Ω),
(distorsion + bruit)	0,006% (8Ω)
puissance de −26 dB (à 1 kHz)	
(distorsion)	0,005% (4Ω),
(distorsion + bruit)	0,06% (4Ω)
puissance de 50 mW (à 1 kHz)	
(distorsion)	0,007% (4Ω),
(distorsion + bruit)	0.1% (4Ω)
Distorsion d’intermodulation	
pour la puissance mesurée à 250 Hz: 8 kHz = 4:1, 4Ω	0,01%
pour la puissance mesurée à 60 Hz: 7 kHz = 4:1, 8Ω	0,007%
Tension résiduelle de bruit	0,3 mV (0,3 mV: IHF A)
Facteur d’amortissement	50 (4Ω), 100 (8Ω)
Sensibilité & impédance d’entrée	
PHONO 1, 2 MM	2,5 mV/47 kΩ
PHONO 1 MC	100μV/47Ω
TUNER, AUX, TAPE 1, 2, REC/PLAY	200 mV/47 kΩ
MAIN IN	1V/18 kΩ

Voltage d’entrée maximum (PHONO, 1 kHz, RMS)		
	MM	250 mV
	MC	10 mV
Réponse de fréquence	**PHONO**	Courbe nominale RIAA 30 Hz ∼ 15 kHz, ±0,15 dB
	TUNER, AUX, TAPE (Straight DC)	0 Hz ∼ 130 kHz, −1 dB 20 Hz ∼ 20 kHz, $^{+0}_{-0,1}$ dB
Rapport signal/bruit pour la puissance nominale, 4Ω	**PHONO 1, 2 MM**	75 dB (90 dB, IHF A)
	PHONO 1 MC	70 dB (80 dB, IHF A)
	TUNER, AUX	90dB (110 dB, IHF A)
pour une sortie de −26 dB, 4Ω	**PHONO 1, 2 MM, PHONO 1 MC**	67 dB
	TUNER, AUX	68 dB
pour une sortie de 50 mW, 4Ω	**PHONO 1, 2 MM, PHONO 1 MC**	60 dB
	TUNER, AUX	60 dB
Réglage de la tonalité	**BASS (graves)**	50 Hz, + 7,5 dB ∼ −7,5 dB
	TREBLE (aigus)	20 kHz, + 7,5 dB ∼ −7,5 dB
Fréquence charnière	**BASS**	125 Hz, 250 Hz, 500 Hz
	TREBLE	2 kHz, 4 kHz, 8 kHz
Filtre subsonique		20 Hz, −12 dB/oct.
Filtre Aigu (HIGH)		7 kHz, − 6 dB/oct.
Correction physiologique (volume à −30 dB)		50 Hz, +7,5 dB
Tension de sortie & impédance	**PRE OUT**	nominale 1 V maxi 7 V
	REC OUT	200 mV
	REC/PLAY	30 mV/82 kΩ
Equilibrage de canaux (250 Hz ∼ 6300 Hz), AUX		±0,5 dB
Séparation des canaux, AUX 1 kHz		60 dB
Niveau de casque et impédance de sortie		600 mV/390Ω
Impédance de charge	**PRINCIPALE ou ELOIGNEE**	4 ∼ 16Ω
	PRINCIPALE + ELOIGNEE	8 ∼ 16Ω

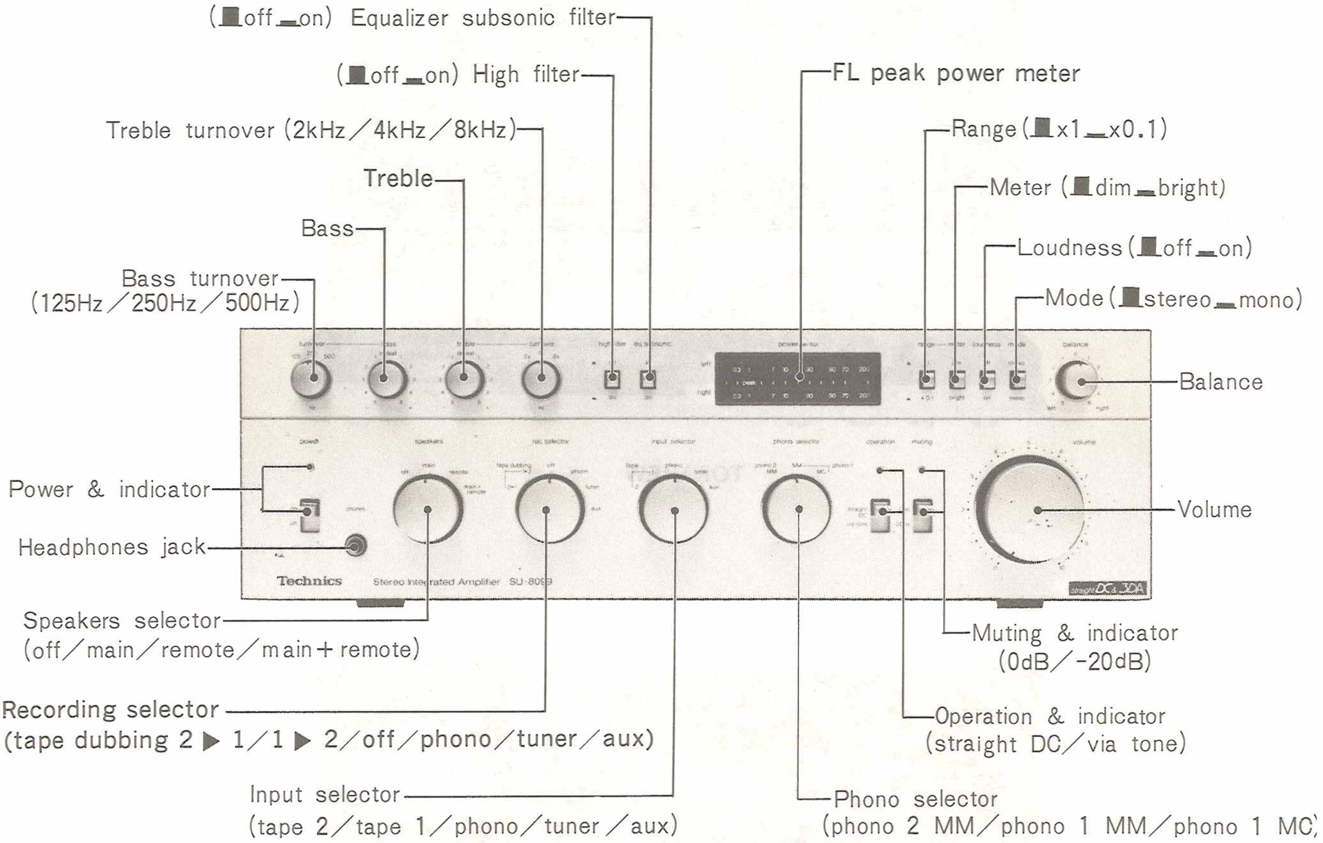
GENERALITES

Consommation	1160 W
Alimentation (50 Hz/60 Hz)	110V/120V/220V/240 V
Dimensions (L x H x Pr)	450 x 142 x 420 mm
Poids	20 kg

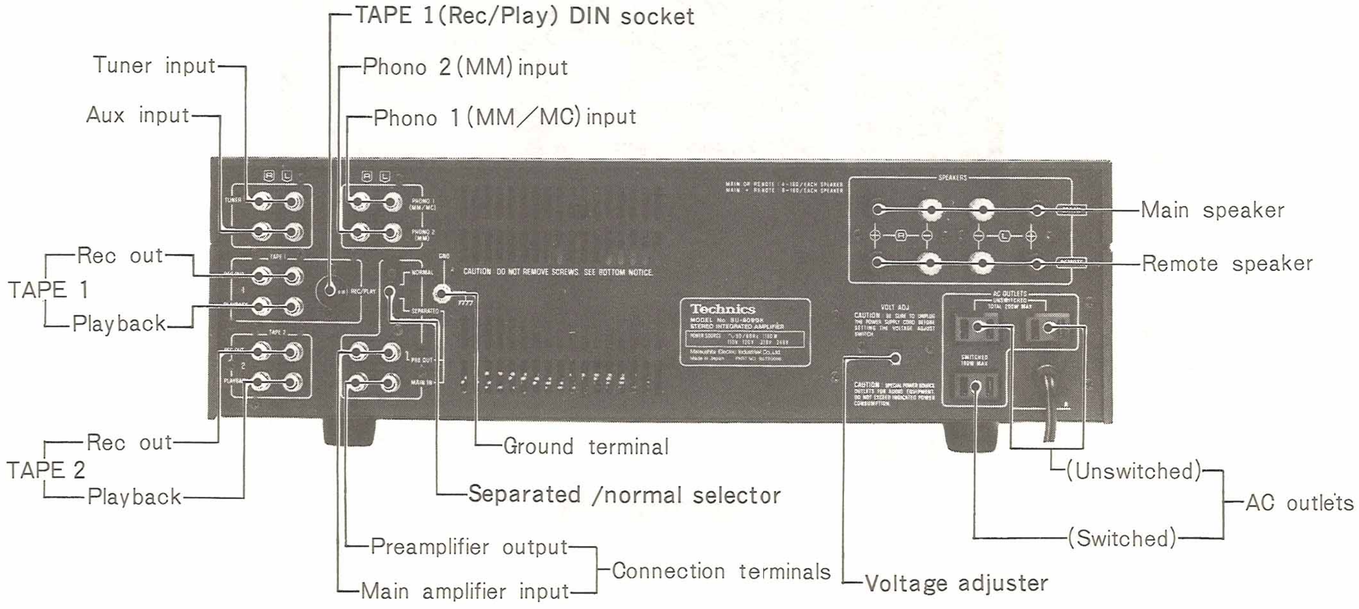
■ CONTENTS

LOCATION OF CONTROLS 3,4
OUTLINE OF THIS UNIT. . . . . 5~7
ALIGNMENT INSTRUCTIONS (ENGLISH) . . . . . . 7~8
ALIGNMENT POINTS. 8
ANWEISUNGEN FÜR ABGLEICHUNG (DEUTSCH). 9
INSTRUCTIONS D'ALGNMENT (FRANÇAIS) 10
PRINTED CIRCUIT BOARD WIRING VIEW. . . . . . . 11~16
TERMINAL GUIDE OF TRANSISTORS AND IC'S. 17
TO REMOVE THE REMOTE - SWITCH BANDS. 17
HOW TO PREPARE LEAD-CONNECTOR SOCKETS. 18
TO REMOVE EQUALIZER AMPLIFIER P.C.B. AND
MAIN AMPLIFIER P.C.B.. 18
PRECAUTIONS FOR REPAIR 19
BLOCK DIAGRAM. 20
BLOCK DIAGRAM OF IC'S 21
REPLACEMENT PARTS LIST (Electric Parts) 22
EXPLODED VIEWS 23, 24
REPLACEMENT PARTS LIST (Cabinet and Chassis Parts) 25
CHANGE OF PARTS LIST 26
SCHEMATIC DIAGRAM 27, 28
REPLACEMENT PARTS LIST
(Resistors and Capacitors Parts). 29, 30

■ LOCATION OF CONTROLS



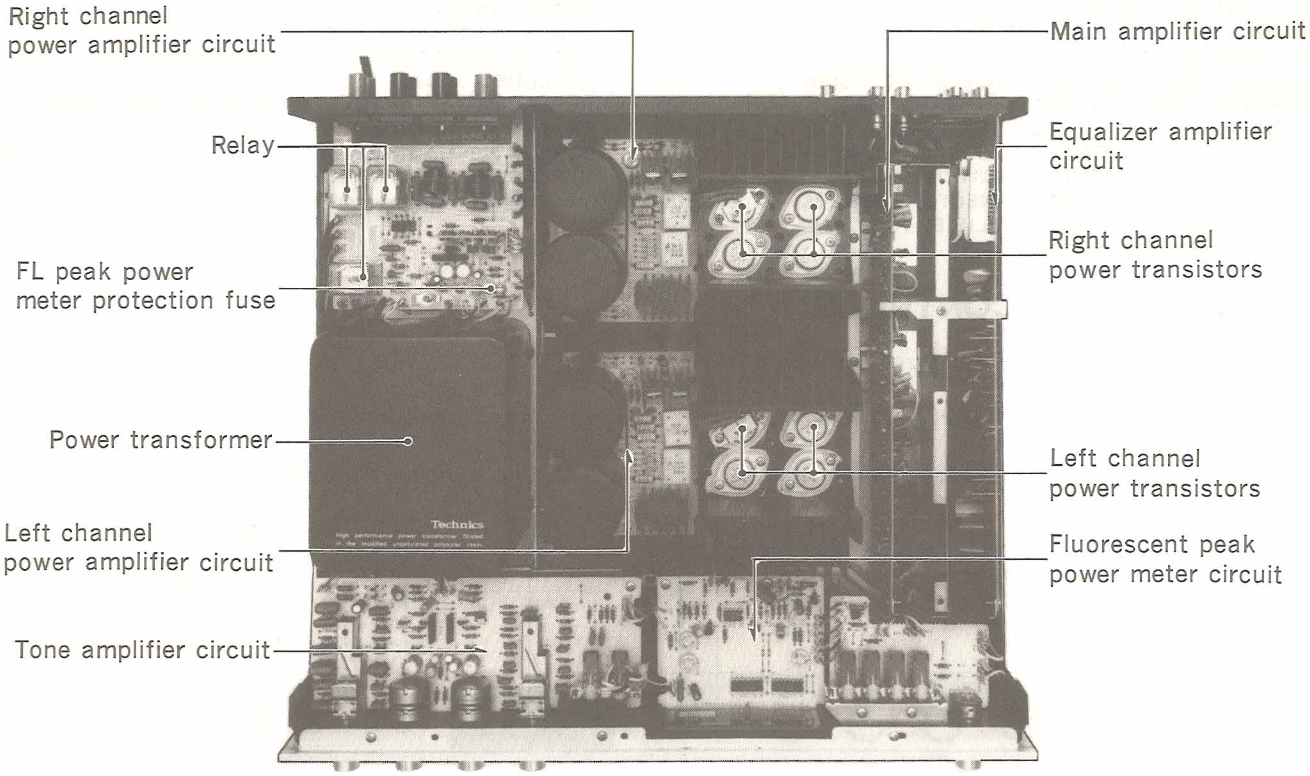
(■off ▬on) Equalizer subsonic filter
(■off ▬on) High filter
Treble turnover (2kHz／4kHz／8kHz)
Treble
Bass
Bass turnover
(125Hz／250Hz／500Hz)
FL peak power meter
Range (■x1 ▬x0.1)
Meter (■dim ▬bright)
Loudness (■off ▬on)
Mode (■stereo ▬mono)
Balance
Power & indicator
Headphones jack
Volume
Speakers selector
(off／main／remote／main＋remote)
Muting & indicator
(0dB／−20dB)
Recording selector
(tape dubbing 2 ▶ 1／1 ▶ 2／off／phono／tuner／aux)
Operation & indicator
(straight DC／via tone)
Input selector
(tape 2／tape 1／phono／tuner／aux)
Phono selector
(phono 2 MM／phono 1 MM／phono 1 MC)
Technics
Stereo Integrated Amplifier SU-8099



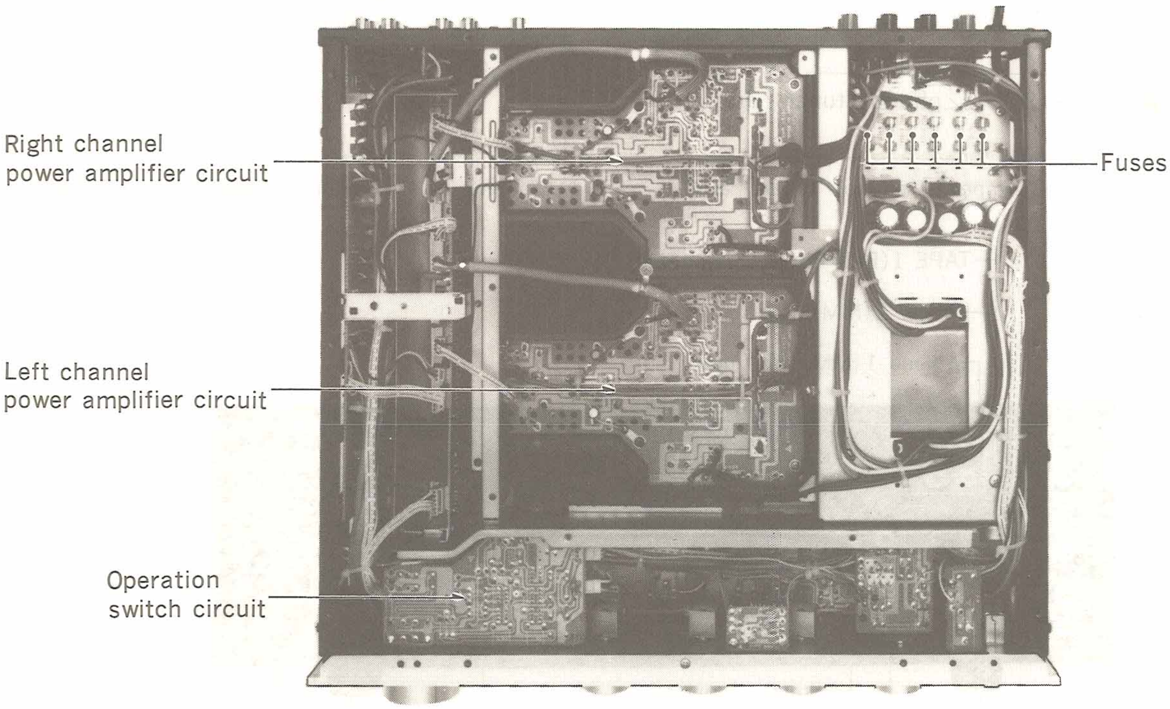
TAPE 1 (Rec/Play) DIN socket
Tuner input
Phono 2 (MM) input
Aux input
Phono 1 (MM／MC) input
Main speaker
Remote speaker
Rec out
TAPE 1
Playback
Rec out
TAPE 2
Playback
Ground terminal
Separated /normal selector
(Unswitched)
AC outlets
(Switched)
Preamplifier output
Connection terminals
Main amplifier input
Voltage adjuster
CAUTION DO NOT REMOVE SCREWS. SEE BOTTOM NOTICE.
Technics

* This rear panel photo shows only the products for SU-8099K (X) and SU-8099K (XA).

* The products for other destinations except SU-8099K (X) and SU-8099K (XA) are not equipped with AC outlets.


Right channel power amplifier circuit
Relay
FL peak power meter protection fuse
Power transformer
Left channel power amplifier circuit
Tone amplifier circuit
Main amplifier circuit
Equalizer amplifier circuit
Right channel power transistors
Left channel power transistors
Fluorescent peak power meter circuit
Technics

TOP VIEW


Right channel power amplifier circuit
Left channel power amplifier circuit
Operation switch circuit
Fuses

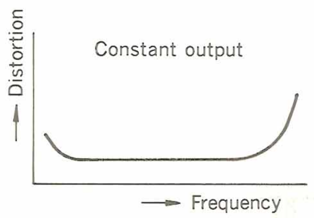
BOTTOM VIEW

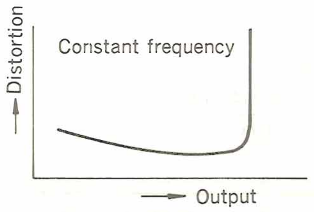
■ OUTLINE OF THIS UNIT

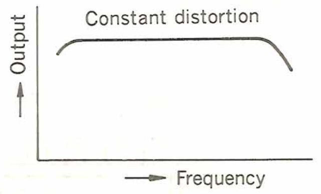
We have been making efforts to develop better audio amps for the improvement of sound quality.
Technics has reconsidered the factors that determain the sound quality of amps and employed a new measuring method in an attempt to make the products perfect.

- **Factors that determine the sound quality of amps**
  There are three essential factors for audio amps just as the three primary colors for light and colors, and rythm, melody and harmony for musics. They are frequency characteristic, distortion and dynamic range (output, S/N ratio).
- **Improvement of slewing rate, rise time and prevention of TIM distortion**
  The improvement of slewing rate and rise time and the prevention of TIM distortion are considered as the basic requirements for obtaining good sound quality. Slewing rate shows the level of output obtained without distortion, represented by the relationship between the maximum output and the frequency characteristic, whereas rise time shows the rising speed of the signal, that is, the level of frequency at a certain output. Also, TIM (Transient Inter Modulation) distortion is considered as distortion due to clip generated inside the amp, but this can be prevented by controlling the static characteristic between frequency and output.
- **3DA system**
  To design good amps, it is important not to control individual characteristic separately, but to control them totally taking all the above-mentioned three factors of audio amps into consideration. In this respect, Technics has newly completed an analysing process using a computer as it is necessary to evaluate the performances of amps taking the relations among these three factors into account. It is the 3DA (3 Dimension Analysis) system.
  Unlike the conventional graphic analysis of only the two factors out of the three, this is really an epoch-making measuring method that represents the relations among frequency, distortion and output in three dimensions.

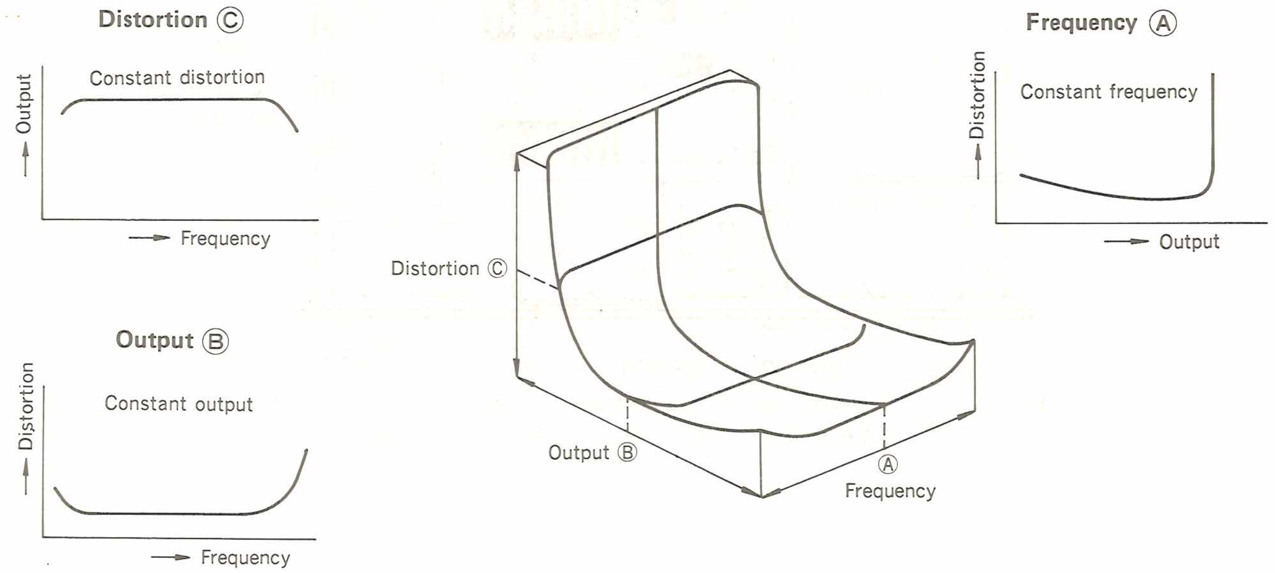
Conventional method - - - This measuring method checks the relation between output and frequency with the output (or frequency and distortion) kept constant. Therefore, it is difficult to find out delicate difference.





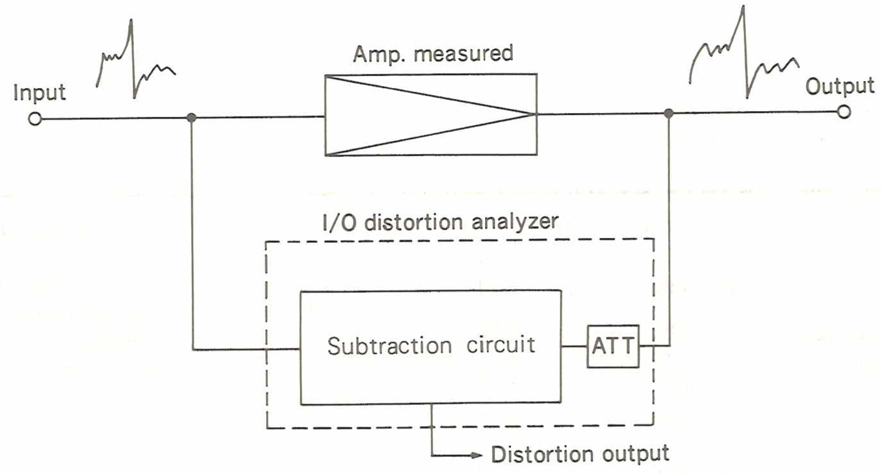


3DA method - - - - - - - - - - This measuring method represents the distortion, frequency and output data in the form of area.
Therefore, it is easy to find out delicate difference, facilitating the improvement of the circuit.



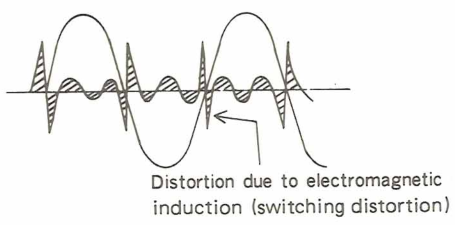
– **How To Read the Diagram** –
For example, when desired to know the state in output Ⓑ (or frequency Ⓐ or distortion Ⓒ), the relation between distortion and frequency can be known from the section at point Ⓑ irrespective of the output level.

- **I/O (Input/Output) distortion**
  Amps which have been developed through the 3DA method are nearly ideal with respect to music reproduction.
  Technics has successfully worked out a new distortion analysis method of amps in order to verify the fact.
  That is the I/O distortion analyzer. The circuit composition is intended to measure the distortion component through subtraction, keeping the amp input and output levels equal to each other.
  The I/O distortion analyzer has made it possible to analyze distortion when a musical signal is added to the input that had been so far considered impossible. Because this product is completed through integral examination of the three factors of newly announced Technics' amps with the use of hearing and 3DA system, it has been confirmed that the I/O distortion is suppressed down to extremely low level.

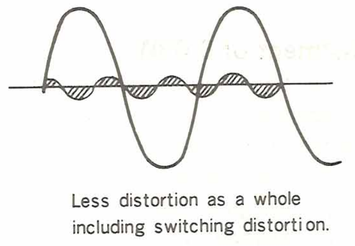


- **Concentrated power block**
  When a current flows into a lead wire, a magnetic field will be generated. If the current is high frequency, it goes outside in the form of a magnetic wave. If there is a separate lead wire, the magnetic wave will cause a voltage to be generated due to the magnetic field.
  In amps, this will result in distortion. Such distortion is greater when the frequency is higher, worsening the high frequency characteristic. In order to avoid this bad influence, the power supply lead wire is connected at the shortest distance. The concentrated power block incorporates a power amplifier and its power supply in its single unit construction.

100kHz distortion of conventional amp.


Distortion due to electromagnetic induction (switching distortion)

100kHz distortion of concentrated power block amp.



- **Bright, easy-to-read pure electronic FL power meter**
  The FL (Fluorescent Lamp) emits light with electrons applied to fluorescent substance. Unlike a conventional mechanical meter, it is fast to respond using light as the output, and most suitable for indicating the level of musical signal varying incessantly. Also, because of the meter range and meter brightness selector switch, it is easy to read the meter indications even when the output is very slight and the brightness of the meter can be changed as needed.
- **Newly developed super linear power transistor (SLPT)**
  The circuit integrates 220 transistors with excellent high frequency characteristic, which realizes 100 KHz (100W + 100W) at 0.05%.

- **High efficiency main amp unit using active thermal servo circuit with excellent DC stability**
  An active thermal servo circuit is employed for the main amplifier section. This circuit system corrects the direct current, generated due to temperature change, etc., through thermal feedback with the servo loop separated from the signal system. Thus, an excellent DC stability can be assured without causing influence to the signal system. As a result, the DC voltage at the speaker terminal at temperatures ranging from −10°C to +50°C is lower than 0±5mV. The output stage displays stable amplification with super linear power transistor (SLPT) used in parallel push-pull style. Also, the speaker protecting circuit combines the load impedance detector by bridge circuit including the speaker load with the DC output detector at the output terminal to prevent the speaker system and the amp itself from being damaged.

■ ALIGNMENT INSTRUCTIONS ENGLISH

1. Adjustment of unbalanced DC voltage, I_{CQ}

- **Setting, and instruments used**
  1. Operation switch. . . . . . .straight DC
  2. Speaker switch . . . . .main
  3. Sound volume. . . . . .0 (minimum)
  4. DC voltmeter
  5. 8-ohm load resistor (used only for unbalanced DC voltage adjustment)
  6. Short-circuit TP1 and TP2 beforehand, and remove it after adjustment.

Adjustments	DC voltmeter connections	Adjusting portions	Adjusting procedure
Unbalanced DC voltage of power amplifier	(+) side. . . . . .814 (−) side. 815	VR401 (Lch)	(1) Set the meter to "O" with measuring range as small as possible Note: If it cannot be adjusted, cut off the jumper wire before adjustment.
	(+) side. . . . . .816 (−) side. 817	VR402 (Rch)	
ICQ(idling current of power transistor)	(+) side. . . . . . . .TP10 (−) side. TP9	VR501 (Lch) (Front of set)	Adjust it to about 30mV a few minutes after turning on the power supply.
	(+) side. . . . . . . .TP8 (−) side. TP7	VR501 (Rch) (Rear of set)	

2. Adjustment of FL power meter

- **Setting, and instruments used**
  1. Input selector . . . . tuner
  2. Speaker switch . . . . main
  3. Meter range switch. . . . . X0.1 or X1
  4. Meter brightness switch . . . . dim or bright
  5. Sound volume. . . . . 10 (max.)
  6. Low frequency oscillator
  7. AC electronic voltmeter
  8. 8-ohm load resistor

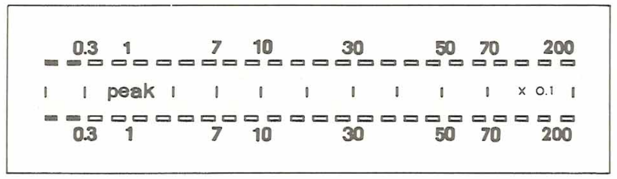
2-1. Adjustment of 0.03W

1) Connect the low frequency oscillator to the tuner terminals for both channels, and the AC electronic voltmeter to the speaker terminals in parallel with the load resistor.
2) Set the meter range switch to "X0.1", and the meter brightness switch to "dim".
3) Add 1 kHz signal from the low frequency oscillator, and regulate the input level so that the AC electronic voltmeter indicates 0.75V.
4) Adjust **VR701** (L ch) while observing the FL power meter until the first segment is about to turn on. (0.3W position of X0.1 range). Refer to fig. 1.
5) Similarly, make the adjustment of **VR702** (R ch). At that time, if the indication of L ch varies, correct **VR701**.

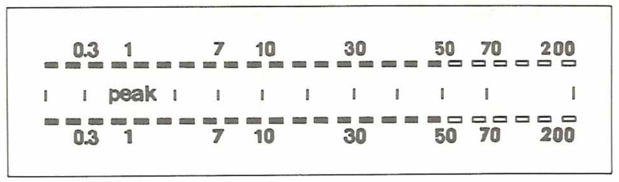
Note: When the adjustment has been made so that the second segment is about to turn on, the first segment turns on without input.

2-2. Adjustment of 50W

1) Set the meter range switch to "X1", and the meter brightness switch to "bright".
2) Regulate the input level so that the AC electronic voltmeter indicates 19V.
3) Make the adjustment in the same way as mentioned in 2-1 by regulating **VR703** (L ch) and **VR704** (R ch) so that the 9th segment (at 50W position) is about to turn on. Refer to fig. 2.
4) Next, make the adjustment in 2-1 (0.03W) by regulating the input level.
5) Again regulate the input level to make the output 19V, and make sure that the segment at 50W position is on.

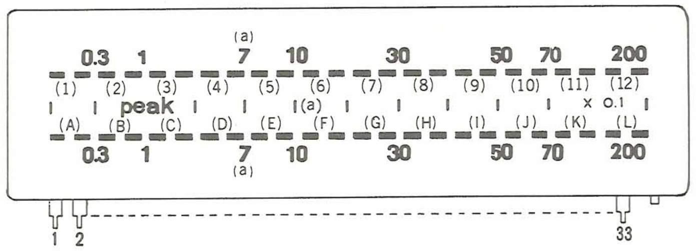

0.3 1 7 10 30 50 70 200
peak
x 0.1
0.3 1 7 10 30 50 70 200

0.03W
Fig. 1


0.3 1 7 10 30 50 70 200
peak
0.3 1 7 10 30 50 70 200

50W
Fig. 2

- **Segment indication pattern**

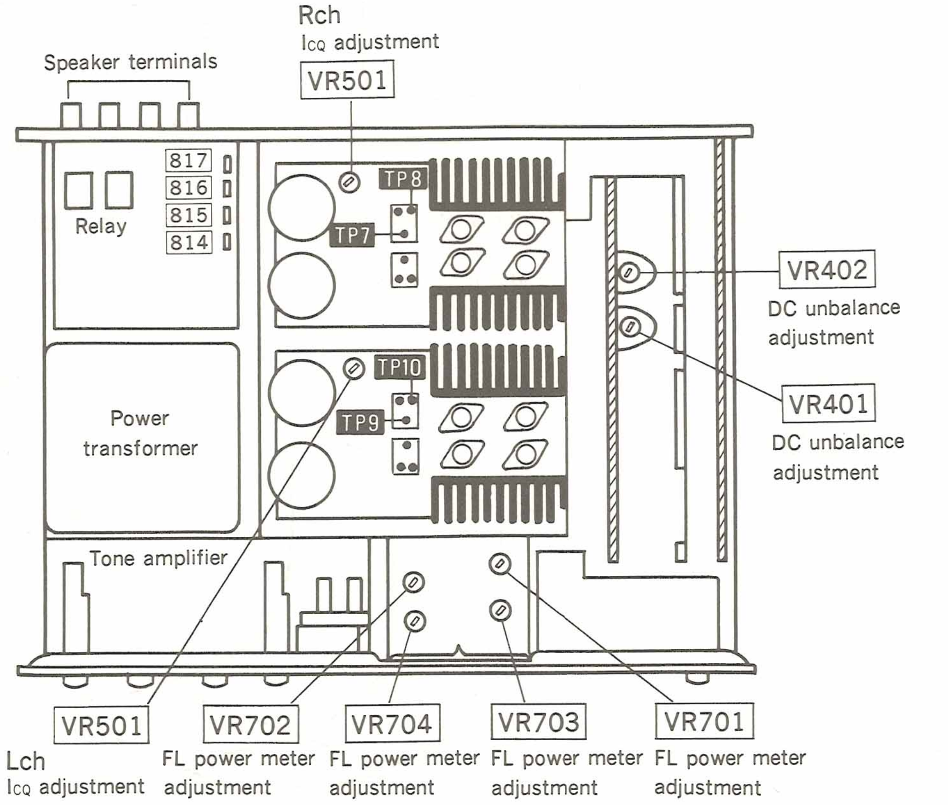

(a)
0.3 1 7 10 30 50 70 200
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12)
peak
(a)
x 0.1
(A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L)
0.3 1 7 10 30 50 70 200
(a)
1
2
33

Terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Electrode	f	peak	a	1	g	2	3	4	5	6	A	B	C	D	E	F	G

Terminal No.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Electrode	g	H	I	J	K	L	7	8	9	10	11	12		×0.1		f

Note: 1. (a) represents the segments for the top and bottom number scales and for central bar scales.
2. Each segment consists of two bars.
(▬ ▬ . . . . . . 1 segment)

■ ALIGNMENT POINTS


Rch
ICQ adjustment
VR501
Speaker terminals
817
816
815
814
Relay
TP8
TP7
TP10
TP9
Power transformer
Tone amplifier
VR402
DC unbalance adjustment
VR401
DC unbalance adjustment
VR501
Lch
ICQ adjustment
VR702
FL power meter adjustment
VR704
FL power meter adjustment
VR703
FL power meter adjustment
VR701
FL power meter adjustment

■ ANWEISUNGEN FÜR ABGLEICHUNG — DEUTSCH

1. Abgleichen der unausgeglichenen Gleichspannung und ICQ (Leerlauf der Leistung TR)

- **Stellungszustand und verwendete Geräte**

1. Betriebsschalter .... straight DC (Gleichstrom)
2. Lautsprecherschalter .... main
3. Lautstärke .... 0 (Min.)
4. Gleichstrom-Voltmesser
5. 8 Ohm Belastungswiderstand (nur für Abgleichen der unausgeglichenen Gleichspannung verwendet.)

Abgleich	Anschluß des Gleichstrom-Voltmessers	Abgleichspunkte	Abgleichsverfahren
Unausgeglichene Gleichspannung des Leistungsverstärkers	(+) Seite........814 (–) Seite........815	VR401 (L)	(1) Mit möglichst kleinem Meßbereich das Meter auf "O" stellen. Anmerkung: Wenn es nicht eingestellt werden kann, vor Einstellung den Schaltdraht abschneiden.
	(+) Seite........816 (–) Seite........817	VR402 (R)	
ICQ (Leerlauf der Leistung TR)	(+) Seite.......TP10 (–) Seite.......TP9	VR501 (L)	Ein paar Minuten nach Schalten auf Leistungszufuhr auf ca. 30mV einstellen.
	(+) Seite.......TP8 (–) Seite.......TP7	VR501 (R)	

2. Abgleichen des FL-Leistungsmeßgerätes

- **Stellungszustand und verwendete Geräte**

1. Eingangsumschalter......................... tuner
2. Lautsprecherschalter......................... main
3. Meßbereichschalter......................... X 0,1 oder X1
4. Schalter für Meßgeräteeleuchtungsstärke .... dim oder bright
5. Lautstärke .... 10 (Max.)
6. Niederfrequenz-Oszillator
7. Wechselstrom-Elektronen-Voltmesser
8. 8 Ohm Belastungswiederstand

2-1. Abgleichen von 0,03W

1) An die Tunerklemmen der beiden Kanäle Niederfrequenz-Oszillator anschließen, und an die Lautsprecherklemme parallel mit Belastungswiederstand den Wechselstrom-Elektronen-Voltmesser anschließen.
2) Meßbereichschalter uaf "x 0,1" und Schalter für Gerätbeleuchtungsstärke auf "dim" stellen.
3) Vom Niederfrequenz-Oszillator 1 kHz Signal speisen, und Eingangspegel so einstellen, daß Wechselstrom-Elektronen-Voltmesser 0,75 anzeigt.
4) Unter Beobachten auf FL-Leistungsmeßgerät VR701 (L-Kanal) einstellen, bis das erste Segment fast aufzuleuchten beginnt. (0,3 x 0,1 W)
5) Anschließend VR702 (R-Kanal) in gleicher Weise abgleichen. Wenn sich dabei die Anzeige des L-Kanals ändert, VR701 berichtigen.

Anmerkung: Wenn das Abgleichen so erfolgt, daß das zweite Segmant fast aufzuleuchten beginnt, so leuchtet das erste Segment ohne Eingang auf.

2-2. Abgleichen von 50 W

1) Meßbereichschalter auf "X1", und Schalter für Gerätbeleuchtungsstärke auf "bright" stellen.
2) Eingangspegel so einstellen, daß Wechselstrom-Elektronen-Voltmesser 19 V anzeigt.
3) Unter Einstellung von VR703 (L-Kanal) und VR704 (R-Kanal) in gleicher Weise wie oben in 2-1 so abgleichen, daß das 9. Segment fast aufzuleuchten beginnt.
4) Dann Eingangspegel einstellen und wie in 2-1 (0,03W) abgleichen.
5) Eingangspegel wieder einstellen, damit der Eingang 19 V wird, und sicherstellen, daß das Segment bei 50 W aufleuchtet.

■ INSTRUCTIONS D'ALGNMENT — FRANÇAIS

1. Réglage de la tension CC déséquilibrée (Temps mort du transformateur d'alimentation.

- **Conditions de l'appareil et équipement utilisé**

1. Commutateur de fonctionnement .... Straight DC
2. Commutateur du haut-parleur .... Principal
3. Volume du son .... 0 (minimum)
4. Voltmètre CC
5. Résistance de 8 ohms de charge (utilisée seulement pour le réglage de la tension CC déséquilibrée)

Réglages	Branchements du voltmétre CC	Sections à régler	Procédé de réglage
Tension CC non équilibrée de l'amplificateur d'alimentation	Côté (+)........814 Côté (–)........815	VR401 (Canal G)	(1) Placer le compteur sur "O" avec la gamme de mesure aussi petite que possible. Note: S'il ne peut pas être ajusté, couper le fil volant avant le réglage.
	Côté (+)........816 Côté (–)........817	VR402 (Canal D)	
Icq (Courant de temps mort du transformateur d'alimentation)	Côte (+).......TP10 Côté (–).......TP9	VR501 (Canal G)	Le régler à environ 15mV quelques minutes aprés avoir branché la source d'alimentation.
	Côté (+).......TP8 Côté (–).......TP7	VR501 (Canal D)	

2. Réglage du compteur d'alimentation FL

- **Conditions de l'appareil et équipement utilisé**

1. Sélecteur d'entrée .... Commande d'accord
2. Commutateur de l'enceinte .... Principal
3. Commutateur de la gamme du compteur.......... x0,1 ou x 1
4. Commutateur de luminosité du compteur .... faible ou clair
5. Volume du son .... 10 maxi.
6. Oscillateur de basse fréquence
7. Voltmètre électronique CA
8. Résistance de 8 ohms de charge

2.1 Réglage de 0,03W

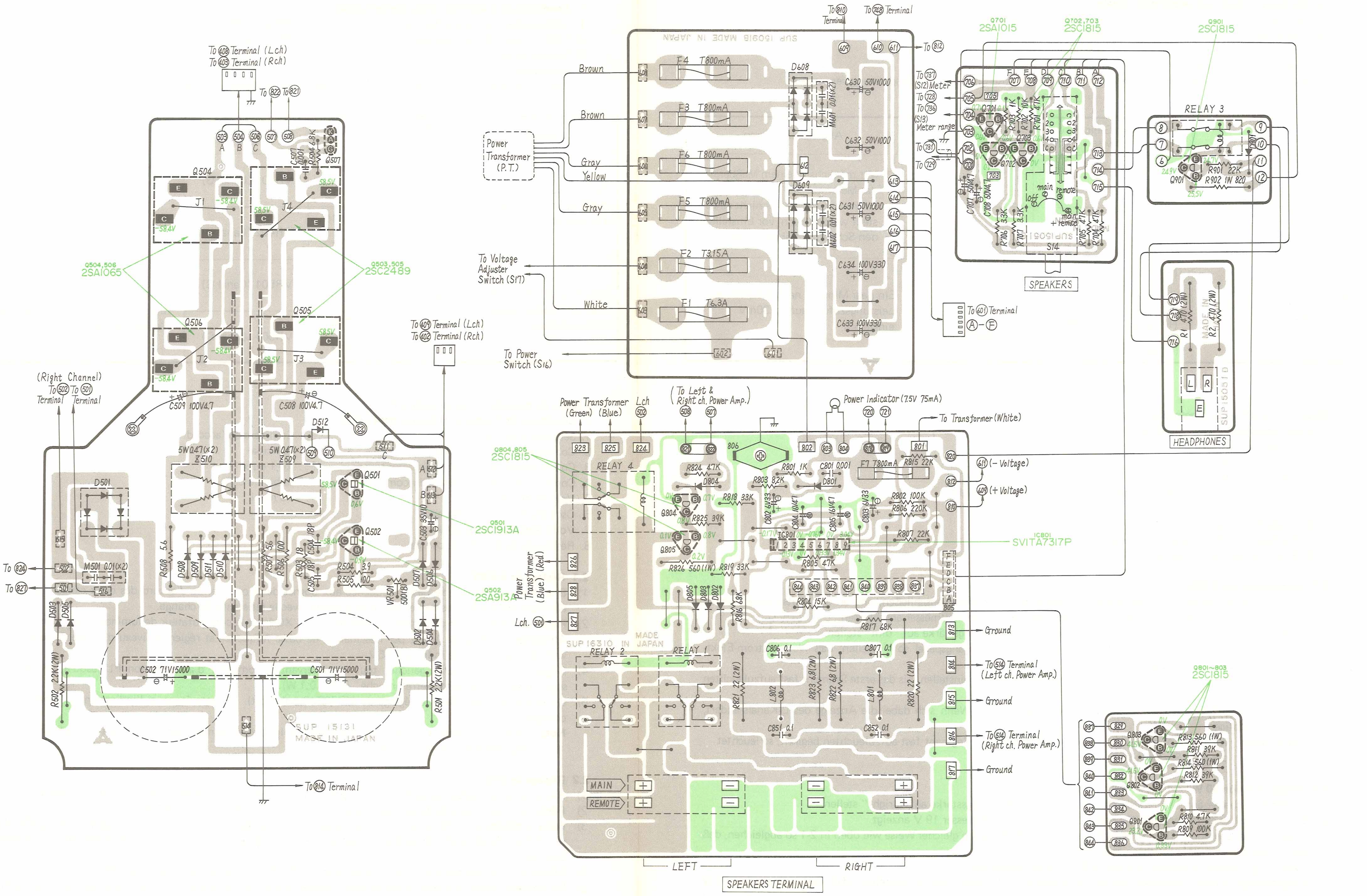
1) Brancher l'oscillateur de basse fréquence aux bornes de la commande d'accord des deux canaux; et le voltmètre électronique aux bornes de l'enceinte en paralléle avec la résistance de change.
2) Placer le commutateur de gamme du compteur sur "X0,1" et le commutateur de luminosité sur "dim"
3) Alimenter un signal de 1 kHz par l'oscillateur de basse fréquence et régler le niveau d'entrée de telle sorte que le voltmètre électronique indique 0,75V.
4) Régler le VR701 (Canal gauche) tout en observant le compteur d'alimentation FL jusqu'à ce que le premier segment soit sur le point d'être branché. (0,3 x 0,1 W).
5) De la même façon, faire le réglage de VR702 (Canal droit). A cette étape, si l'indication du canal gauche varie, corriger VR701.

Note: Quand le rélage a été fait de telle sorte que le second segment est sur le point d'être branché, le premier segment s'allume sans entrée.

2.2 Réglage de 50W

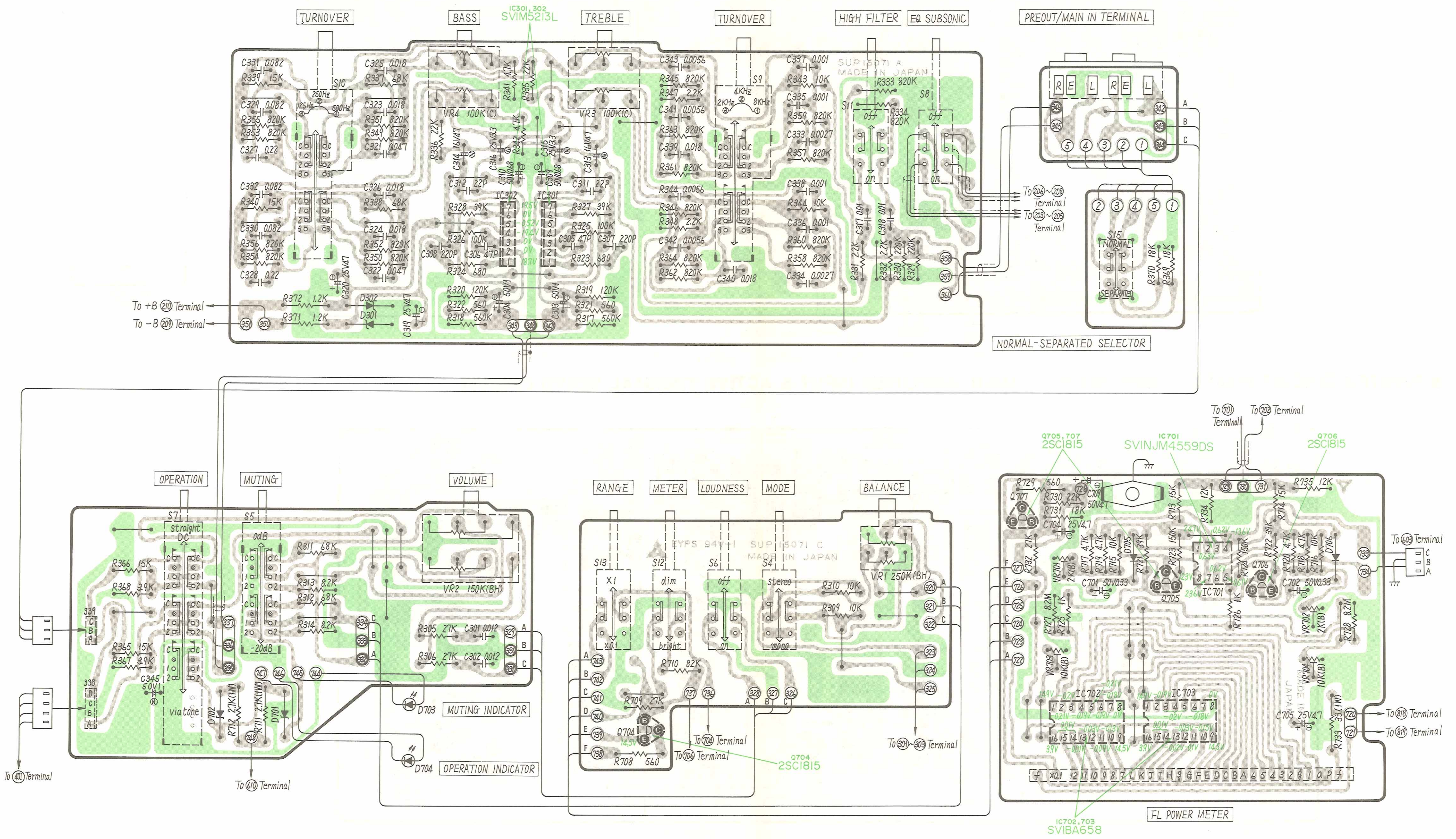
1) Régler le commutateur de gamme du compteur sur "X1" et le commutateur de luminosité sur "bright".
2) Régler le niveau d'entrée de telle sorte que le compteur électronique indique 19V.
3) Faire le réglage de la même façon que le réglage mentionné dans le paragraphe 2-1 en réglant VR703 (Canal gauche) et VR704 (Canal droit) de telle sorte que le neuvième segment (dans la position de ROW) soit sur le point d'être branché.
4) Effectuer le réglage comme dans le paragraphe 2-1 (0,03W) en réglant le niveau d'entrée.
5) De nouveau régler le niveau d'entrée pour donner une sortie de 19V et s'assurer que le segment à la position 50W, est branché.

■ PRINTED CIRCUIT BOARD WIRING VIEW ...... POWER AMPLIFIER, SPEAKERS PROTECTION & POWER SUPPLY CIRCUITS

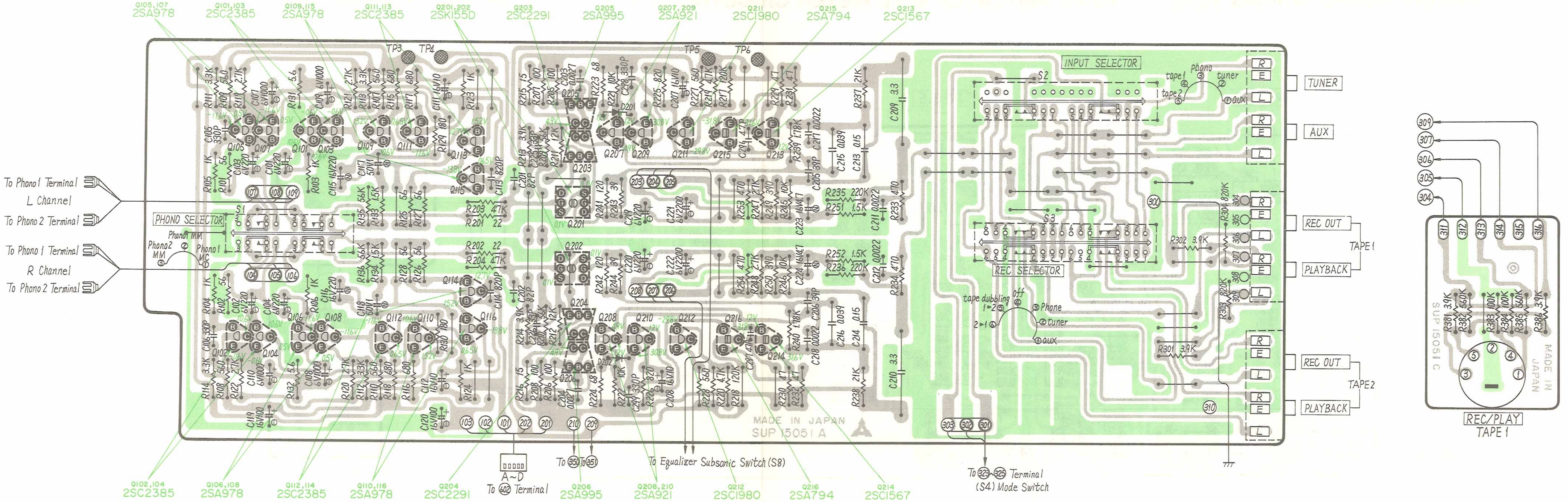

To 408 Terminal (Lch)
To 403 Terminal (Rch)
To 822 To 821
Q504
Q507
J1
J4
Q504,506 2SA1065
Q503,505 2SC2489
Q506
Q505
J2
J3
(Right Channel)
To 502 Terminal
To 501 Terminal
C509 100V4.7
C508 100V4.7
D512
5W 0.47(×2) Z510
5W 0.47(×2) Z509
D501
Q501 2SC1913A
Q502 2SA913A
To 824
To 827
M501 0.01(×2)
R508 5.6
R504 3.9
R505 100
VR501 500(B)
C502 71V15000
C501 71V15000
R502 2.2K(2W)
R501 2.2K(2W)
SUP 15131 MADE IN JAPAN
To 814 Terminal
To 409 Terminal (Lch)
To 402 Terminal (Rch)
To 810 Terminal
To 248 Terminal
To 812
SUP 15091B MADE IN JAPAN
Brown
Brown
Gray
Yellow
Gray
White
Power Transformer (P.T.)
F4 T800mA
F3 T800mA
F6 T800mA
F5 T800mA
F2 T3.15A
F1 T6.3A
D608
D609
C630 50V1000
C632 50V1000
C631 50V1000
C634 100V330
C633 100V330
M601 0.01(×2)
M602 0.01(×2)
To Voltage Adjuster Switch (S17)
To Power Switch (S16)
To 601 Terminal Ⓐ-Ⓕ
Q701 2SA1015
Q702,703 2SC1815
Q901 2SC1815
To 737 (S12) Meter
To 728
To 736 (S13) Meter range
To 731
To 729
R703 1K
R702 10K
R704 4.7K
C707 50V4.7
C708 50V4.7
R706 3.3K
R707 3.3K
R705 4.7K
R708 4.7K
main
remote
off
main + remote
SUP 15061
S14
SPEAKERS
RELAY 3
R901 22K
R902 1W 820
R1 470(2W)
R2 470(2W)
SUP 15051 D
HEADPHONES
Power Transformer (Green) (Blue)
Lch 502
(To Left & Right ch. Power Amp.)
Power Indicator (7.5V 75mA)
To Transformer (White)
Q804,805 2SC1815
RELAY 4
R824 4.7K
D804
R818 33K
R825 39K
R826 560(1W)
R819 33K
R801 1K
R803 8.2K
C801 0.01
D801
F7 T800mA
R815 22K
R802 100K
R806 220K
R807 22K
R805 4.7K
R804 15K
R816 6.8K
R817 68K
IC801 SVITA7317P
611 (− Voltage)
609 (+ Voltage)
Power Transformer (Blue) (Red)
Lch. 501
SUP 16310 IN JAPAN MADE
RELAY 2
RELAY 1
C806 0.1
C807 0.1
R821 22(2W)
R823 6.8(2W)
R822 6.8(2W)
R820 22(2W)
L802
L801
C851 0.1
C852 0.1
Ground
To 514 Terminal (Left ch. Power Amp.)
Ground
To 514 Terminal (Right ch. Power Amp.)
Ground
MAIN
REMOTE
LEFT
RIGHT
SPEAKERS TERMINAL
Q801~803 2SC1815
R813 560(1W)
R811 39K
R814 560(1W)
R812 39K
R810 4.7K
R809 100K

■ PRINTED CIRCUIT BOARD WIRING VIEW ...... TONE AMPLIFIER & FL-METER CIRCUITS

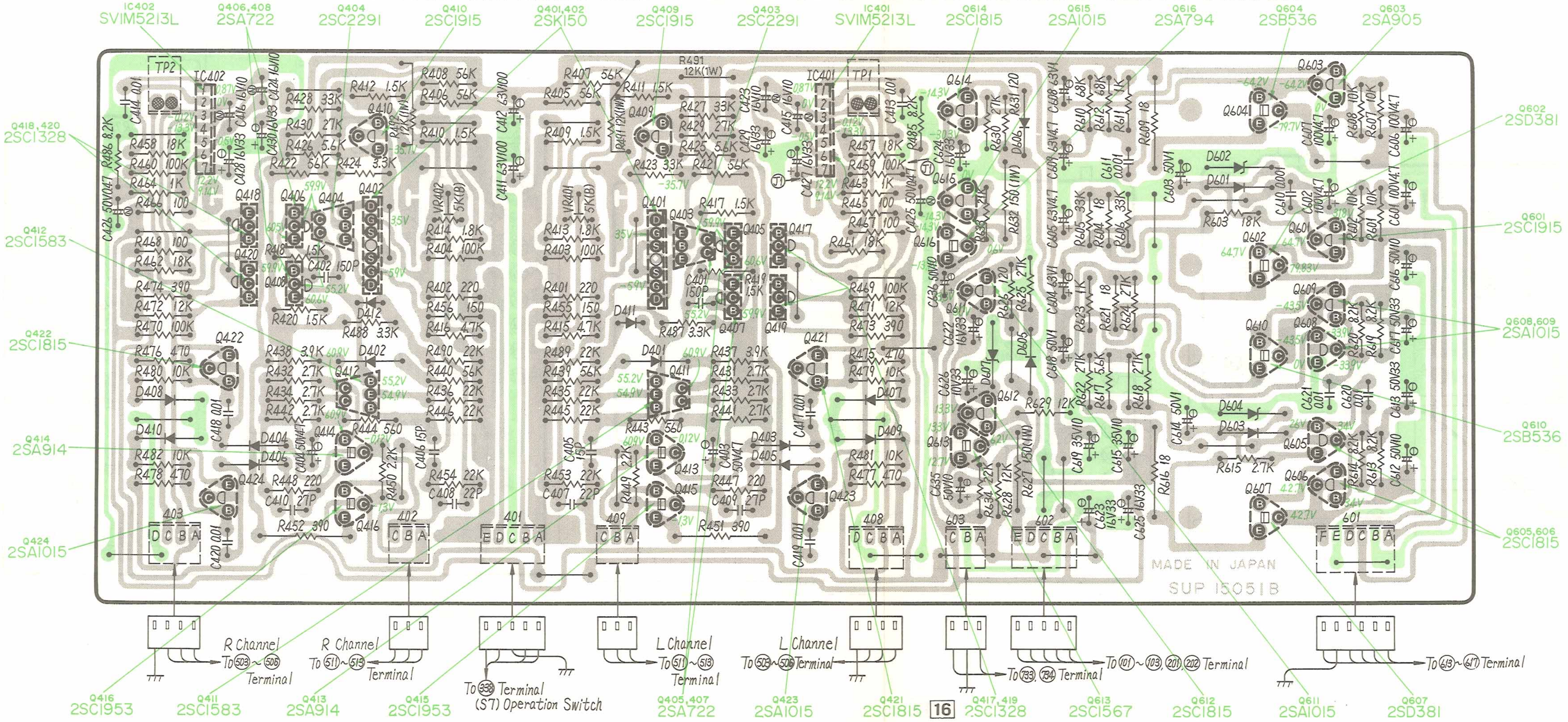
🟩 Earth (Ground) Lines


TURNOVER
BASS
IC301, 302
SVIM5213L
TREBLE
TURNOVER
HIGH FILTER
EQ SUBSONIC
PREOUT/MAIN IN TERMINAL
VR4 100K(C)
VR3 100K(C)
S10
S9
S11
S8
SUP 15071 A
MADE IN JAPAN
IC302
IC301
To +B 210 Terminal
To −B 209 Terminal
To 206~208 Terminal
To 203~205 Terminal
S15
NORMAL
SEPARATED
NORMAL-SEPARATED SELECTOR
OPERATION
MUTING
VOLUME
S7
straight DC
viatone
S5
0dB
−20dB
VR2 150K(BH)
D703
MUTING INDICATOR
D704
OPERATION INDICATOR
To 401 Terminal
To 610 Terminal
RANGE
METER
LOUDNESS
MODE
BALANCE
S13
S12
S6
S4
x1
x0.1
dim
bright
off
on
stereo
mono
SUP 15071 C
MADE IN JAPAN
VR1 250K(BH)
Q704
To 704 Terminal
To 706 Terminal
To 301~303 Terminal
Q704
2SC1815
To 701 Terminal
To 702 Terminal
Q705, 707
2SC1815
IC701
SVINJM4559DS
Q706
2SC1815
To 603 Terminal
IC702
IC703
To 818 Terminal
To 819 Terminal
FL POWER METER
IC702, 703
SVIBA658

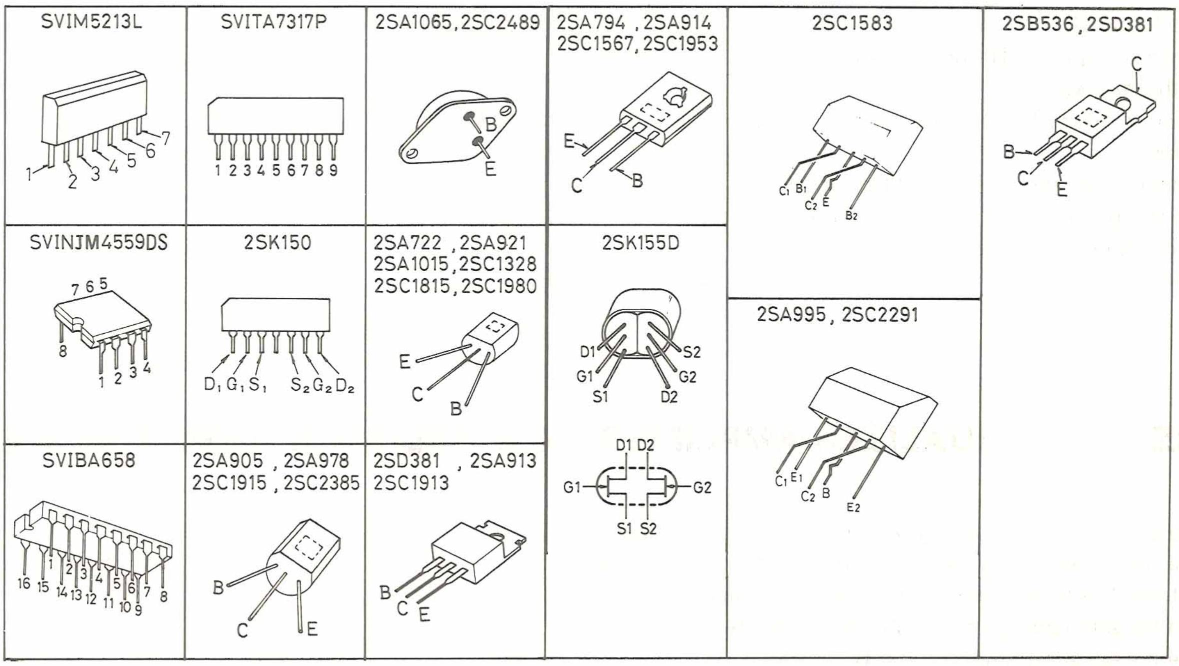
■ PRINTED CIRCUIT BOARD WIRING VIEW ...... MC PRE-PRE AMPLIFIER & EQUALIZER AMPLIFIER CIRCUIT


Q105,107 2SA978
Q101,103 2SC2385
Q109,115 2SA978
Q111,113 2SC2385
Q201,202 2SK155D
Q203 2SC2291
Q205 2SA995
Q207,209 2SA921
Q211 2SC1980
Q215 2SA794
Q213 2SC1567
TP3
TP4
TP5
TP6
To Phono1 Terminal
L Channel
To Phono2 Terminal
To Phono1 Terminal
R Channel
To Phono2 Terminal
PHONO SELECTOR
Phono MM
Phono2 MM
Phono1 MC
S1
INPUT SELECTOR
S2
tape1
tape2
Phono
tuner
aux
TUNER
AUX
REC OUT
PLAYBACK
TAPE1
REC SELECTOR
S3
tape dubbing
1→2
2→1
off
Phono
tuner
aux
REC OUT
PLAYBACK
TAPE2
MADE IN JAPAN
SUP 15051 A
A~D
To 402 Terminal
To 350 To 351
To Equalizer Subsonic Switch (S8)
To 323~325 Terminal
(S4) Mode Switch
Q102,104 2SC2385
Q106,108 2SA978
Q112,114 2SC2385
Q110,116 2SA978
Q204 2SC2291
Q206 2SA995
Q206,210 2SA921
Q212 2SC1980
Q216 2SA794
Q214 2SC1567
309
307
306
305
304
311
312
313
314
315
316
SUP 15051 C
MADE IN JAPAN
REC/PLAY
TAPE 1

■ PRINTED CIRCUIT BOARD WIRING VIEW ...... MAIN AMPLIFIER INPUT & ACTIVE THERMAL SERVO CIRCUIT


IC402 SVIM5213L
Q406,408 2SA722
Q404 2SC2291
Q410 2SC1915
Q401,402 2SK150
Q409 2SC1915
Q403 2SC2291
IC401 SVIM5213L
Q614 2SC1815
Q615 2SA1015
Q616 2SA794
Q604 2SB536
Q603 2SA905
Q418,420 2SC1328
Q412 2SC1583
Q422 2SC1815
Q414 2SA914
Q424 2SA1015
Q602 2SD381
Q601 2SC1915
Q608,609 2SA1015
Q610 2SB536
Q605,606 2SC1815
TP2
TP1
MADE IN JAPAN
SUP 15051 B
R Channel
To 503~505 Terminal
R Channel
To 511~515 Terminal
To 359 Terminal
(S7) Operation Switch
L Channel
To 511~515 Terminal
L Channel
To 503~506 Terminal
To 733 734 Terminal
To 101~103, 201, 202 Terminal
To 615~617 Terminal
Q416 2SC1953
Q411 2SC1583
Q413 2SA914
Q415 2SC1953
Q405,407 2SA722
Q423 2SA1015
Q421 2SC1815
Q417,419 2SC1328
Q613 2SC1567
Q612 2SC1815
Q611 2SA1015
Q607 2SD381

■ TERMINAL GUIDE OF TRANSISTORS AND IC'S


SVIM5213L
1 2 3 4 5 6 7
SVITA7317P
1 2 3 4 5 6 7 8 9
2SA1065, 2SC2489
B
E
2SA794, 2SA914
2SC1567, 2SC1953
E
C
B
2SC1583
C1 B1
C2 E
B2
2SB536, 2SD381
C
B
C
E
SVINJM4559DS
7 6 5
8
1 2 3 4
2SK150
D1 G1 S1 S2 G2 D2
2SA722, 2SA921
2SA1015, 2SC1328
2SC1815, 2SC1980
E
C
B
2SK155D
D1 S2
G1 G2
S1 D2
D1 D2
G1 G2
S1 S2
2SA995, 2SC2291
C1 E1
C2 B
E2
SVIBA658
1 2 3 4 5 6 7 8
16 15 14 13 12 11 10 9
2SA905, 2SA978
2SC1915, 2SC2385
B
C
E
2SD381, 2SA913
2SC1913
B
C E

■ TO REMOVE THE REMOTE-SWITCH BANDS

1. Use a small screwdriver to push the projection of the remote-switch bands in the direction shown by the arrow in figure 3, and remove them from the remote switch.
2. When removing, remove Ⓐ in figure 4 first.
3. When attaching, attach Ⓑ in figure 4 first, and then install Ⓐ.
4. Check to be sure that the remote-switch bands are securely attached to the remote switch.

Note: When removing the remote-switch bands, be careful not to pull the bands nor to hold them as shown in Ⓒ of figure 3, because to do so may result in damage. Also be careful not to bend or twist the bands excessively.

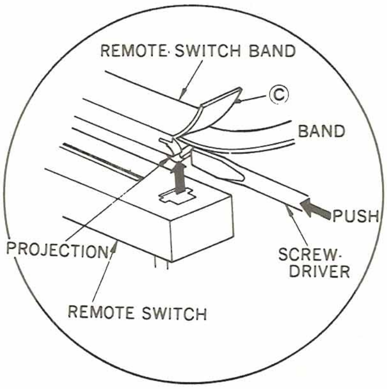

REMOTE SWITCH BAND
Ⓒ
BAND
PUSH
PROJECTION
SCREW-DRIVER
REMOTE SWITCH

Fig. 3

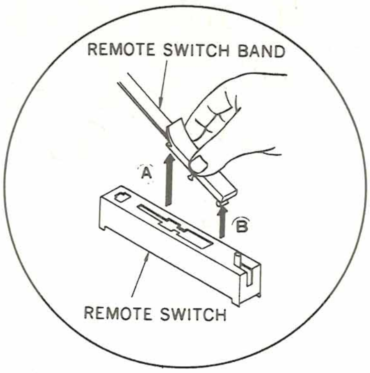

REMOTE SWITCH BAND
Ⓐ
Ⓑ
REMOTE SWITCH

Fig. 4

■ HOW TO PREPARE LEAD-CONNECTOR SOCKETS

1. As shown in figure 5 Ⓐ, insert the lead wire into the terminal.
2. As shown in figure 5 Ⓑ, press the terminal to secure the lead wire.
3. As shown in figure 5 Ⓒ, insert into a connecting socket.
4. To remove from the socket, hold the terminal with a sharp-point tool such as a needle, as shown in figure 6, and pull out the lead wire at the same time.

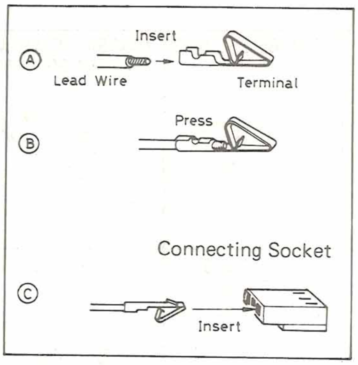

Ⓐ
Insert
Lead Wire
Terminal
Ⓑ
Press
Connecting Socket
Ⓒ
Insert

Fig. 5

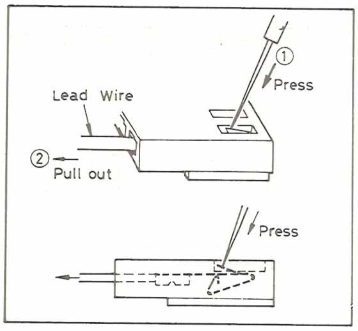

①
Press
Lead Wire
② Pull out
Press

Fig. 6

■ TO REMOVE EQUALIZER AMPLIFIER P.C.B AND MAIN AMPLIFIER P.C.B.

1. Remove the setscrew (①in Fig. 7) used to secure the metal fitting.
2. Remove the 8 setscrews used to secure the tuner, aux, tape deck 1 and 2 connection terminal of rear panel (Fig. 7)
3. Pull out the 8 sockets inserted into the main amplifier P.C.B. (Fig. 8)
4. Remove the setscrew (③ in Fig. 7) used to secure the chassis.
5. Remove the equalizer amplifier P.C.B.
6. The main amplifier P.C.B. can be detached by removing 2 setscrews (② , ④ in Fig. 7) used to secure the chassis.

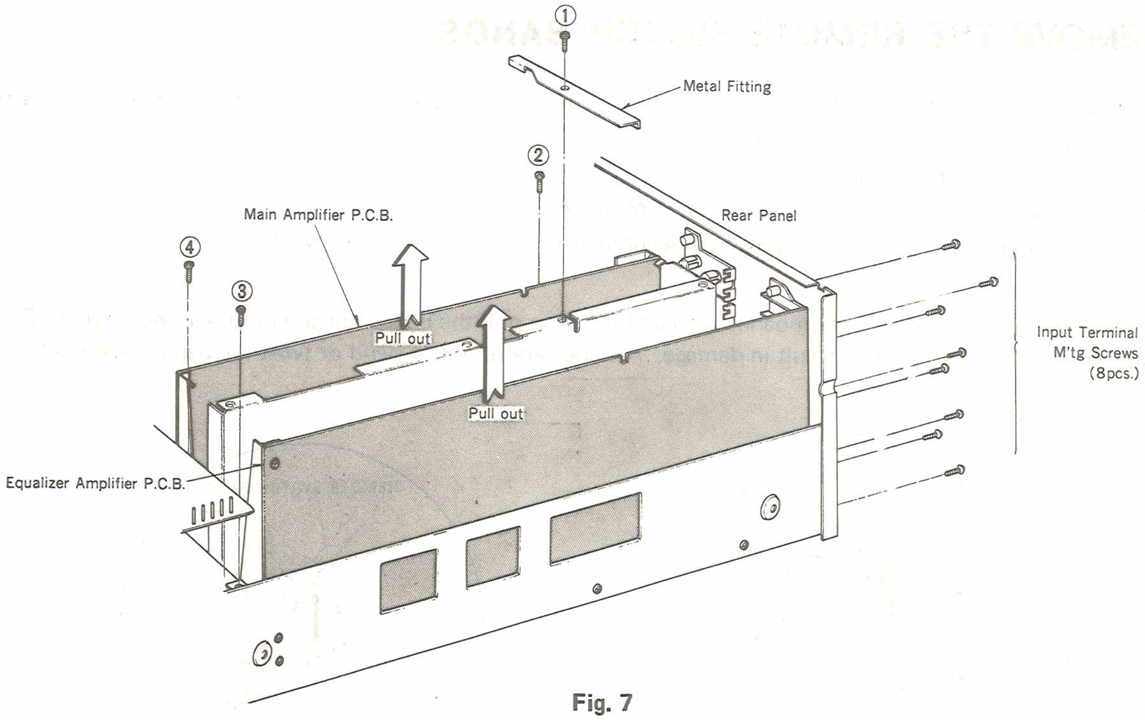

①
Metal Fitting
②
Main Amplifier P.C.B.
Rear Panel
④
③
Pull out
Pull out
Input Terminal
M'tg Screws
(8pcs.)
Equalizer Amplifier P.C.B.

Fig. 7

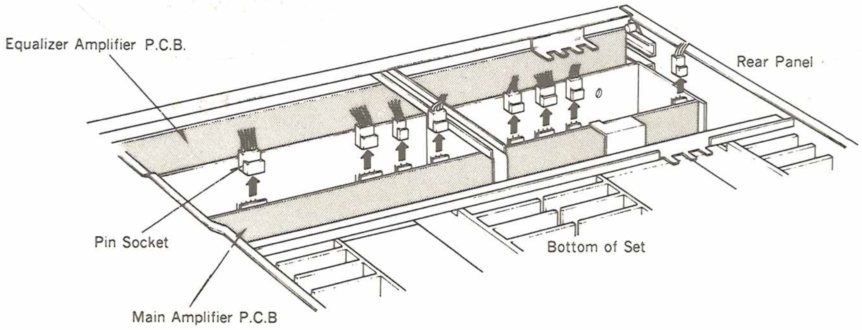
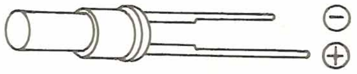

Equalizer Amplifier P.C.B.
Rear Panel
Pin Socket
Bottom of Set
Main Amplifier P.C.B

Fig. 8

■ PRECAUTIONS FOR REPAIR

1. Before repairing this unit, disconnect the power supply line and then short-circuit between the poles of each capacitor (15000μF) by means of resistor (10Ω, 3W) to discharge all the four capacitors. Do not use a screwdriver or the like, otherwise the transistors or diodes will be damaged. When replacing the power transistors, be sure to use 2SA1065 and 2SC2489 which are same in h_{FE} (Common Emitter Direct Current Gain) rank.
2. The S/N ratio of the equalizer circuit may be influenced depending on the way of lead wire arrangement. So, after repair of this circuit, twist the leads of phono 1 and 2 evenly 5 or 6 times before connecting them to the terminals. Such may decrease the hum level. (See Fig. 9)
3. The transistors (Q405·Q417, Q406·Q418, Q407·Q419, Q408·Q420) of the active thermal servo circuit are installed with each pair of transistors completely fitted in a cap so that the temperature change can be accurately detected. Apply bonds on transistors and cover them with the cap (SUV429). (See Fig.10)
4. When connecting the terminals for muting and operation indicator to the LED's (D703, D704), be careful of the polarity. (See Fig. 11)

Muting ········ ⊕Red ⊖Black
Operation ······ ⊕Yellow ⊖Black



D703, 704(SVDGD4203SRD)

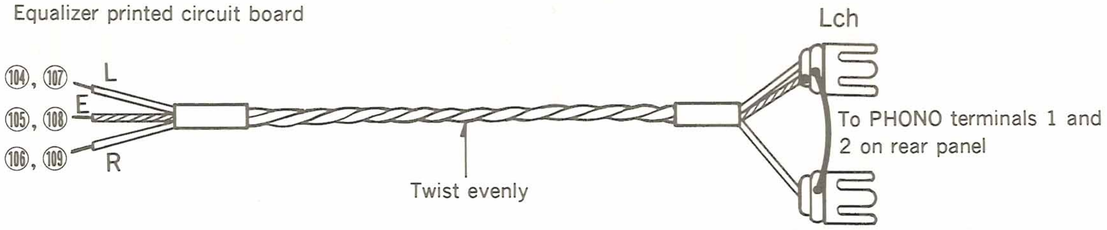

Equalizer printed circuit board
(104), (107)
(105), (108)
(106), (109)
L
E
R
Twist evenly
Lch
To PHONO terminals 1 and 2 on rear panel
Rch

Fig. 9

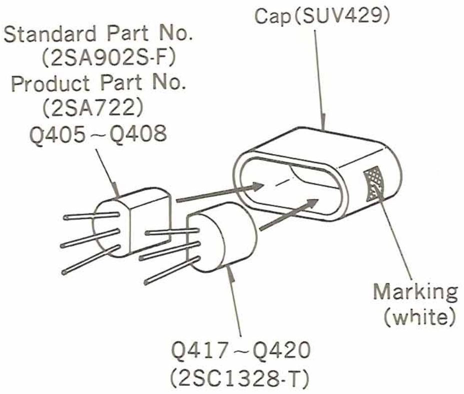

Standard Part No. (2SA902S-F)
Product Part No. (2SA722)
Q405~Q408
Cap(SUV429)
Marking (white)
Q417~Q420 (2SC1328-T)

Fig. 10

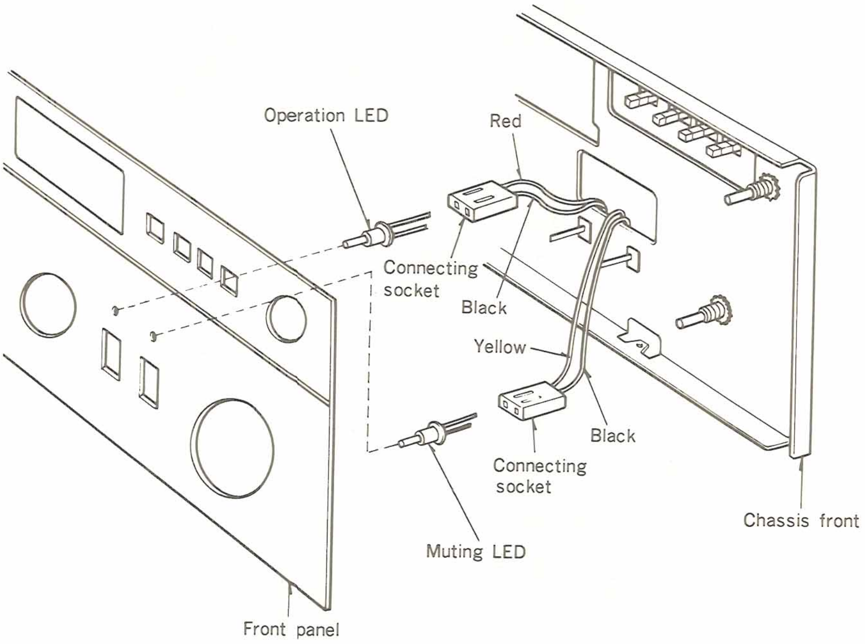
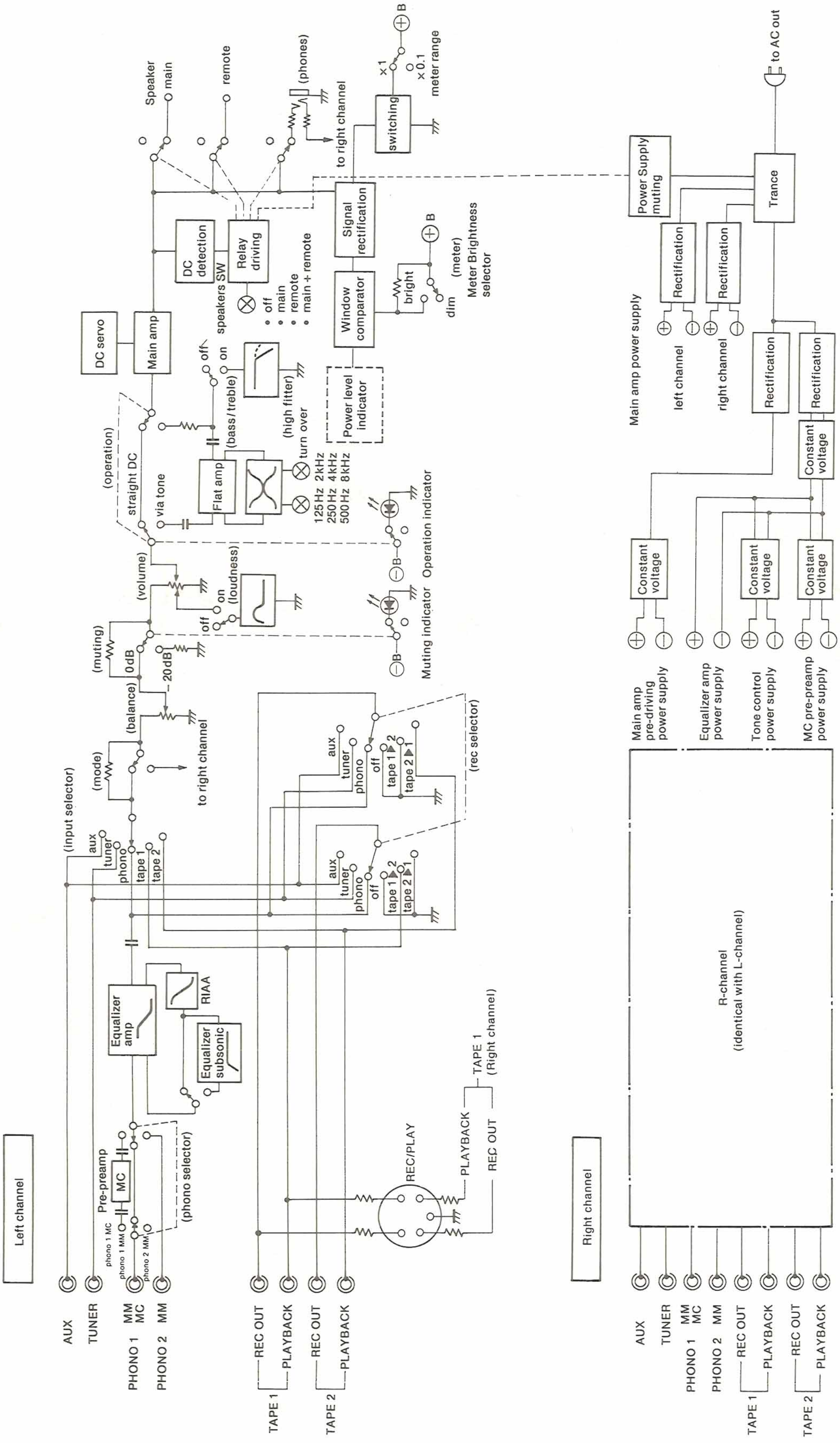
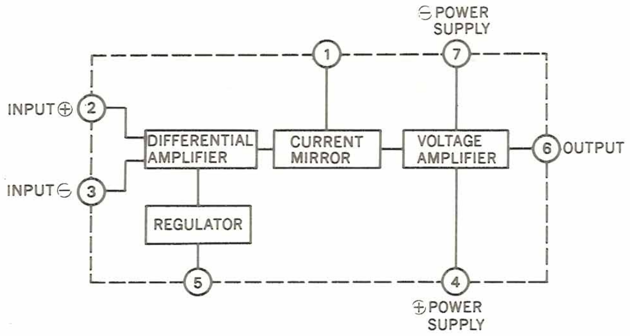

Operation LED
Red
Connecting socket
Black
Yellow
Black
Connecting socket
Chassis front
Muting LED
Front panel

Fig. 11

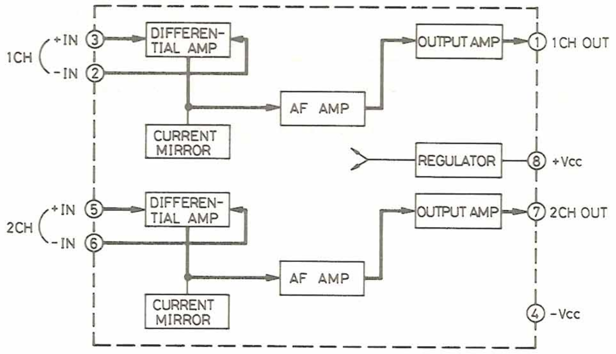
■ BLOCK DIAGRAM


Left channel
AUX
TUNER
PHONO 1 MM MC
PHONO 2 MM
phono 1 MC
phono 1 MM
phono 2 MM
Pre-preamp
MC
(phono selector)
Equalizer amp
RIAA
Equalizer subsonic
(input selector)
aux
tuner
phono
tape 1
tape 2
(mode)
to right channel
(balance)
(muting)
0dB
−20dB
(volume)
off
on
(loudness)
(operation)
straight DC
via tone
Flat amp
(bass/treble)
125Hz 250Hz 500Hz
2kHz 4kHz 8kHz
turn over
(high filter)
off
on
DC servo
Main amp
DC detection
Relay driving
speakers SW
off
main
remote
main + remote
Speaker
main
remote
(phones)
to right channel
Signal rectification
Window comparator
Power level indicator
bright
dim
(meter)
Meter Brightness selector
switching
×1
×0.1
meter range
⊕B
⊖B
Muting indicator
Operation indicator
(rec selector)
aux
tuner
phono
off
tape 1 ▶ 2
tape 2 ▶ 1
TAPE 1
REC OUT
PLAYBACK
TAPE 2
REC OUT
PLAYBACK
REC/PLAY
PLAYBACK
REC OUT
TAPE 1 (Right channel)
Right channel
R-channel (identical with L-channel)
AUX
TUNER
PHONO 1 MM MC
PHONO 2 MM
TAPE 1 REC OUT PLAYBACK
TAPE 2 REC OUT PLAYBACK
Main amp pre-driving power supply
Equalizer amp power supply
Tone control power supply
MC pre-preamp power supply
Constant voltage
Constant voltage
Constant voltage
Constant voltage
Rectification
Rectification
Main amp power supply
left channel
right channel
Rectification
Rectification
Power Supply muting
Trance
to AC out

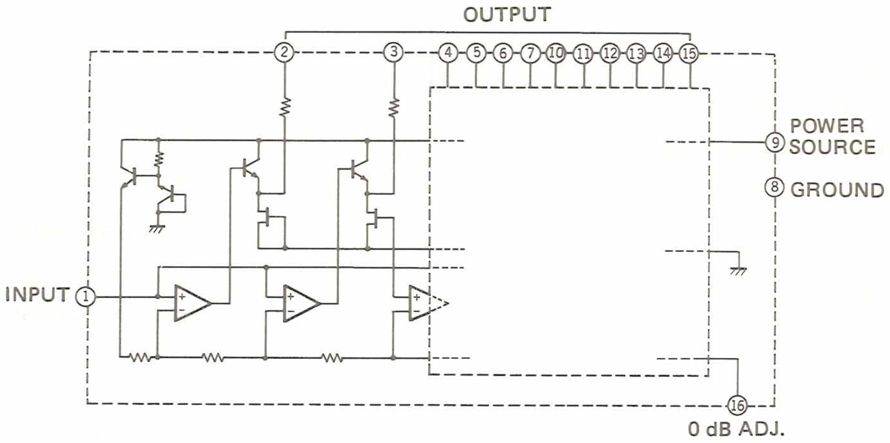
■ BLOCK DIAGRAM OF IC'S


⊖POWER SUPPLY
1
7
INPUT⊕ 2
INPUT⊖ 3
DIFFERENTIAL AMPLIFIER
CURRENT MIRROR
VOLTAGE AMPLIFIER
6 OUTPUT
REGULATOR
5
4
⊕POWER SUPPLY

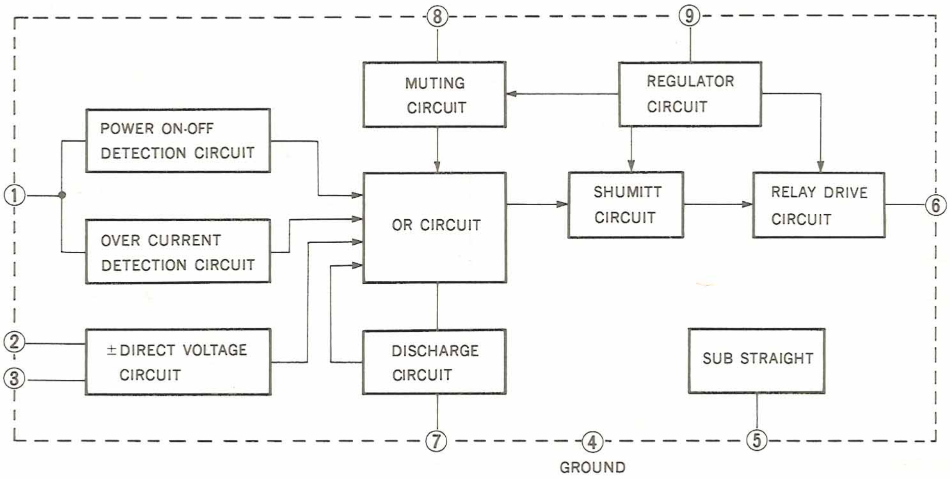
IC301, 302, 401, 402
(SVIM5213L)
Tone amplifier thermal servo


1CH
+IN 3
-IN 2
DIFFEREN-TIAL AMP
CURRENT MIRROR
AF AMP
OUTPUT AMP
1 1CH OUT
REGULATOR
8 +Vcc
2CH
+IN 5
-IN 6
DIFFEREN-TIAL AMP
CURRENT MIRROR
AF AMP
OUTPUT AMP
7 2CH OUT
4 -Vcc

IC701
(SVINJM4559DS)
FL meter operation amplifier


OUTPUT
2
3
4
5
6
7
10
11
12
13
14
15
9 POWER SOURCE
8 GROUND
INPUT 1
16
0 dB ADJ.

IC701, 702
(SVIBA658)
Power output level comparator


8
9
MUTING CIRCUIT
REGULATOR CIRCUIT
POWER ON-OFF DETECTION CIRCUIT
1
OR CIRCUIT
SHUMITT CIRCUIT
RELAY DRIVE CIRCUIT
6
OVER CURRENT DETECTION CIRCUIT
2
3
±DIRECT VOLTAGE CIRCUIT
DISCHARGE CIRCUIT
SUB STRAIGHT
7
4
GROUND
5

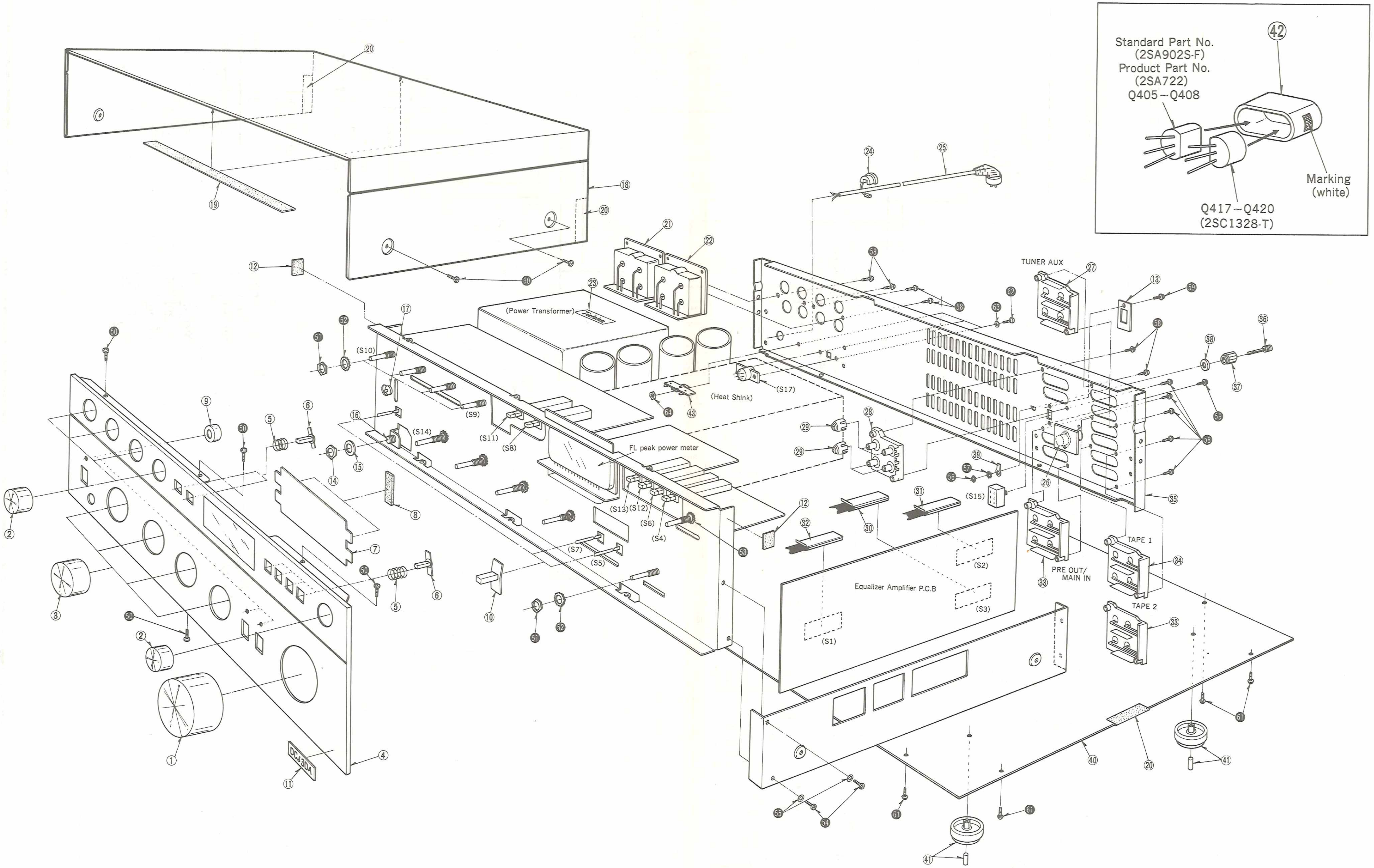
IC801
(SVITA7317P)
Speaker protection operation amplifier

■ REPLACEMENT PARTS LIST ...... Electric Parts

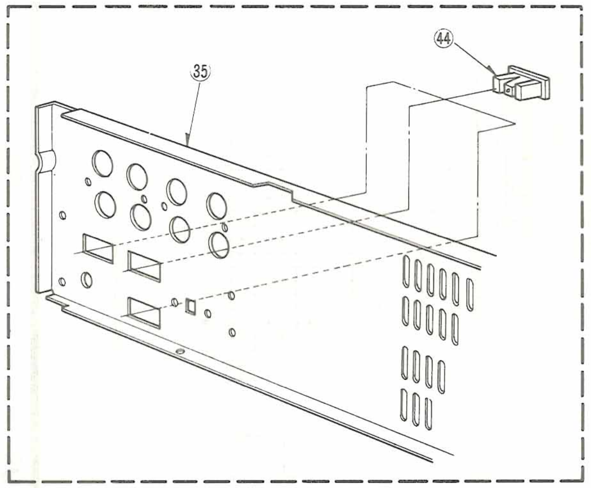
NOTES 1:
1. Part numbers are indicated on most mechanical parts.
   Please use this part number for parts orders.
2. ⚠ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.		Part No.	Part Name & Description
		INTEGRATED CIRCUITS	
IC301, 302, 401, 402		SVIM5213LCO	IC, Tone Amplifier & Active Thermal Servo
IC701		SVINJM4559DS.	IC, FL Meter Operation Amplifier
IC702, 703		SVIBA658	IC, Power Output Level Comparator
IC801		SVITA7317P	IC, Speaker Protection Operation Amplifier
		TRANSISTORS	
Q101, 102, 103, 104, 111, 112, 113, 114		2SC2385-G	Transistor, MC Amplifier (Use in ranks G or H) Use in pair ranks as same as Q101 ~ 115 and Q116
Q105, 106, 107, 108, 109, 110, 115, 116		2SA978-G	Transistor, MC Amplifier, (Use in ranks G or H)
Q201, 202		2SK155D	Transistor, Equalizer Input Differential Amplifier [FET]
Q203, 204		2SC2291N-G	Transistor, Current Stabilizer (Use in ranks F or G)
Q205, 206		2SA995N-G	Transistor, Current Mirror (Use in ranks F or G)
Q207, 208, 209, 210		2SA921-T	Transistor, Equalizer Amplifier (Use in ranks S, T or U)
Q211, 212		2SC1980-T	Transistor, Equalizer Amplifier (Use in ranks R, S or T)
Q213, 214		2SC1567-Q	Transistor, Equalizer Output Amplifier (Use in ranks Q or R)
Q215, 216		**2SA794-Q**	Transistor, Equalizer Output Amplifier (Use in ranks Q or R)
Q401, 402		2SK150-G	Transistor, Main Amp. Input Differential Amplifier [FET] (Use in ranks G or B)
Q403, 404		2SC2291N-G	Transistor, Current Stabilizer (Use in ranks F or G)
Q405, 406, 407, 408		**2SA902S-F**	Transistor, Current Mirror (Product Part No. 2SA722) (Use in ranks F or G)
Q409, 410		2SC1915-G	Transistor, Current Stabilizer (Use in ranks F or G)
Q411, 412		2SC1583-G	Transistor, Differential Amplifier (Use in ranks F or G)
Q413, 414		2SA914-R	Transistor, Drive Amplifier (Use in ranks Q or R)
Q415, 416		2SC1953-R	Transistor, Drive Amplifier (Use in ranks Q or R)
Q417, 418, 419, 420		**2SC1328-T**	Transistor, Grow Temperature (Use in ranks S, T or U)
Q421, 422		2SC1815-O	Transistor, Current Limiter (Use in ranks Y or O)
Q423, 424		2SA1015-O	Transistor, Current Limiter (Use in ranks Y or O)
Q501 (X2)		2SC1913A-R	Transistor, Drive Amplifier (Use in ranks Q or R) Use in pari ranks as same as Q501 and Q502.
Q502 (X2)		2SA913A-R	Transistor, Drive Amplifier (Use in ranks Q or R)
Q503 (X2), 505 (X2)		2SC2489-O	Transistor, Power Amplifier (Use in ranks P, Q or R) Use in pair ranks as same as Q503 ~ 505 and 506.
Q504 (X2), 506 (X2)		2SA1065-O	Transistor, Power Amplifier (Use in ranks P, Q or R)
Q507 (X2)		SVTTT201-110	Transistor, Thermal Switching
Q601		2SC1915-G	Transistor, Voltage Stabilizer (Use in ranks F or G)
Q602, 607		**2SD381A-L9**	Transistor, Voltage Stabilizer Output (+) (Product Part No. 2SD381-K, L or M)
Q603		2SA905-G	Transistor, Voltage Stabilizer (Use in ranks F or G)
Q604, 610		**2SB536A-L9**	Transistor, Voltage Stabilizer Output (−) (Product Part No. 2SB536-K, L or M)
Q605, 606, 612, 614		2SC1815-O	Transistor, Voltage Stabilizer (Use in ranks Y or O)
Q608, 609, 611, 615		2SA1015-O	Transistor, Voltage Stabilizer (Use in ranks Y or O)
Q613		2SC1567-Q	Transistor, Voltage Stabilizer Output (+) (Use in ranks Q or R)
Q616		**2SA794-Q**	Transistor, Voltage Stabilizer Output (−) (Use in ranks Q or R)
Q701		2SA1015-O	Transistor, Meter Range Switching (Use in ranks Y or O)
Q702, 703, 704, 705, 706, 707, 801, 802, 803, 804, 805, 901		2SC1815-O	Transistor, Meter Range Switching, Emitter Follower & Relay Driver (Use in ranks Y or O)
		DIODES	
D201, 202, 401, 402		SVDMA26-1	Diode, Bias Supply
D301, 302		SVDMZ318	Diode, Zener 18V
D403, 404, 405, 406		MA150	Diode, Current Limiter Circuit
D407, 408, 409, 410		MA162	Diode
D411, 412, 503 (X2), 504 (X2)		SVDMA26-2	Diode, Current Limiter Circuit
D501 (X2)	⚠	SVDM4C-41	Rectifier, Power Amplifier Power Supply
D502 (X2), 505 (X2), 508 ~ 511 (X2)		MA150	Diode, Drive Amplifier
D506 (X2), 507 (X2)		MA162A	Diode, Drive Amplifier
D512 (X2)		SVDSTV4HG	Diode, Varistor
D601, 603		MA150	Diode
D602		SVDMZ330-A2	Diode, Zener 30V
D604		SVDMZ324-A2	Diode, Zener 24V
D605, 606		SVDMA26-2	Diode
D607		SVDHZ6A1L	Diode, Zener, 6V
D608, 609	⚠	SVDS1RBA20	Rectifier
D701, 702		SVDMZ312	Diode, Zener 12V
D703, 704		SVDGD4203SRD	Light Emitting Diode
D705, 706, 801		MA150	Diode
D802, 803, 805, 901		SVDSR1K2	Diode, Pulse Killer
D804		SVDMA26-1	Diode
		COILS and TRANSFORMER	
L801, 802		SLQY16G-1U	Coil, Power Output
T1	⚠	SLT5S35	Transformer, Power Source
		COMPONENT COMBINATIONS	
M501 (X2), 601, 602		RXAF103P22HD	Component Combination, 0.01μF (X2)
Z509 (X2), 510 (X2)	⚠	ERF5GEKR47N	Component Combination, 0.47Ω, 5W (X2)
		LAMP	
PL1	⚠	**XAMR28K500**	Lamp, Power Indicator (7.5V 75mA)
		VARIABLE RESISTORS	
VR1		EWKK4A085252	Balance Control, 250kΩ (BH)
VR2		EWCJ5AF25BC5	Volume Control, 150kΩ (B)
VR3		EWF7XA063C15	Treble Control, 100kΩ (C)
VR4		EWF8XA063C15	Bass Control, 100kΩ (C)
VR401, 402		EVMHOGA00B53	DC Unbalance Adjustment, 5kΩ (B)
VR501 (X2)		EVTR4AA00B52	Power Amp. Idring Current Adjustment, 500Ω (B)
VR701, 702		EVTR4AA00B23	Fluorescent Meter Adjustment, 2kΩ (B)
VR703, 704		EVTR4AA00B14	Fluorescent Meter Adjustment, 10kΩ (B)
		FUSES	
F1	⚠	XBA2C63TR0	Fuse, T6.3A (250V)
F2	⚠	XBA2C31TR0	Fuse, T3.15A (250V)
F3, 4, 5, 6, 7	⚠	XBA2C08TR0	Fuse, T800mA (250V)
		RELAYS	
RELAY 1, 2	⚠	SSY19-1	Relay, Speaker Output
RELAY 3		SSY31	Relay, Headphones Output
RELAY 4	⚠	SSY47	Relay, P.T. Coil 2nd Tap Selection
		SWITCHES	
S1		ESA2691	Switch, Phono Selector
S2, 3		ESA2682	Switch, Input & Recording Mode Selector
S4, 6, 12, 13		SSH419	Switch, Mode, Loudness, Meter & Range
S5		SSL129	Switch, AF Muting
S7		SSL131	Switch, Operation
S8, 11		SSH255	Switch, Equalizer Subsonic & High Filter
S9, 10		SSR129	Switch, Treble & Bass Turnover Selector
S14		SSR131	Switch, Speaker Selector
S15		SSS43	Switch, Normal & Separate Selector
S16	⚠	ESL21182	Switch, Power Source
S17	⚠	ESE37200	Switch, Voltage Adjuster
		METER	
FL		SAD24A15YS	Meter, Fluorescent Peak Power

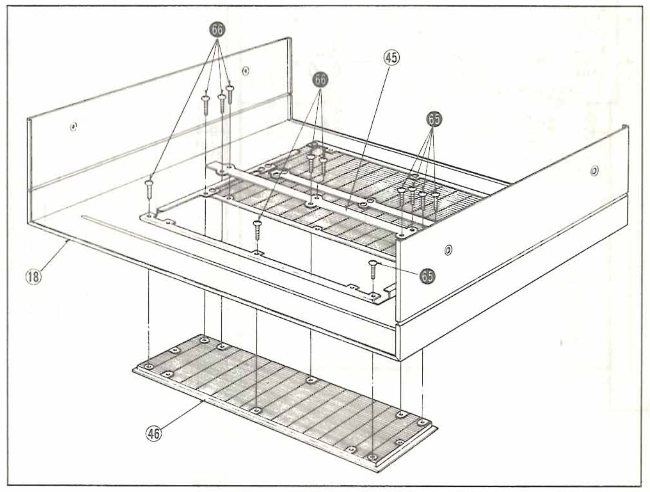
■ EXPLODED VIEWS


Standard Part No.
(2SA902S-F)
Product Part No.
(2SA722)
Q405～Q408
Marking
(white)
Q417～Q420
(2SC1328-T)
(Power Transformer)
(Heat Shink)
FL peak power meter
Equalizer Amplifier P.C.B
TUNER AUX
TAPE 1
TAPE 2
PRE OUT/
MAIN IN
DC430A
(S1)
(S2)
(S3)
(S4)
(S5)
(S6)
(S7)
(S8)
(S9)
(S10)
(S11)
(S12)
(S13)
(S14)
(S15)
(S17)
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳
㉑
㉒
㉓
㉔
㉕
㉖
㉗
㉘
㉙
㉚
㉛
㉜
㉝
㉞
㉟
㊱
㊲
㊳
㊴
㊵
㊶
㊷
㊸
(50)
(51)
(52)
(53)
(54)
(55)
(56)
(57)
(58)
(59)
(60)
(61)
(62)
(63)
(64)

Addition of AC outlets, only products for SU-8099K (X) and SU-8099K (XA)



Cabinet of products for United Kingdom (XE) SU-8099K



■ REPLACEMENT PARTS LIST ...... Cabinet and Chassis Parts(SU-8099)

Notes: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts order.
2. ⚠ indicates that only parts specified by the manufacturer be used for sefety.

Ref. No.		Part No.	Part Name & Description
		CABINET and CHASSIS PARTS	
1		SBN777	Knob, Volume
2		SBN771	Knob, Balance, Turnover, Treble and Bass
3		SBN769	Knob, Phono Selector, Rec Selector Input Selector and Speakers
4		SGWU8099M	Panel, Front Ass'y (Pearl Silver)
5		SUS123-2	Spring, Push Switches
6		SBC197	Button, Push Switches
7		SDU15	Filter, FL Peak Power Meter
8		SHG1479	Rubber Cushion, Filter
9		SHG1481	Bracket, LED Indicators
10		SBD19	Knob, Lever Switches
11		SGK1263	Label, Front Panel (straight DC & 3DA)
12		SHG6051	Rubber Cushion, Side Chassis
13		SHR5025	Stopper, PRE-MAIN Connecting Switch
14		**XNS12**	Nut, Headphones Jack M'tg
15		SNE59-1	Washer, Headphones Jack
16		XCJ6P21B-A	Jack, Headphones
17		SHGA204	Rubber Bracket, Power Indicator
18		SKA10070	Cabinet
19		SHS1009	Fiber, Cabinet
20		SHS1013	Fiber, Bottom Board and Cabinet
21		SJF4411	Terminal, Speakers Left Channel
22		SJF4411-1	Terminal, Speakers Right Channel
23		SGK1265	Label, Technics
24		SHR127	Bushing, AC Cord
25	⚠	SJA97	AC Cord, with Plug
25 [XSW] only	⚠	SJA111	AC Cord, with Plug
26		SJS6501	Socket, TAPE 1 REC/PALY (DIN)
27		SJF3431SN	Terminal, Tuner & Aux
28		SJF2431SA	Terminal, Phono 1 and Phono 2
29		SJP1103-1	Pin Plug, Phono Input Terminal
30		ESA333	Remote Switch, Rec Selector
31		ESA336	Remote Switch, Input Selector
32		ESA338	Remote Switch, Phono Selector
33		SJF3431N	Terminal, Pre Out and Main In, Tape 2
34		SJF3431-2SN	Terminal, Tape 1
35 [D, XSW]		SGP1310-1A	Rear Panel
35 Except for [D, XSW]		SGPU8099D	Rear Panel, SGP1310-1A with Name Plate (SGT20050)
36		SNEA204-2S	Terminal, Earth (Ground)
37		SNE4017	Terminal, Earth (Ground)
38		SNTA421	Washer, Earth Terminal
39		RJT204A	Lug, Earth Terminal
40		SKU7190-3	Bottom Board
41		SKL171	Foot, Bottom Board (with Lock Pin)
42		SUV429	Bracket, Transistors
43		SJR205	Terminal Strip, 2 pin
		SCREWS, WASHERS and NUTS	
㊿		**XTB3+8BFN**	Screw, Front Panel M'tg
(51)		**XNS8**	Nut, Volume, Balance, Treble, Bass and Selector M'tg
(52)		**XWC8B**	Washer, Volume, Treble, Bass and Selector Switch
(53)		**XWC9B**	Washer, Balance Volume
(54)		**XTB3+8BFZ**	Screw, Side Chassis M'tg
(55)		**XWC3B**	Washer, Side Chassis Screw
(56)		**XNG4BS**	Nut, Earth (Ground) Terminal M'tg
(57)		**XWC4B**	Washer, Earth (Ground) Terminal
(58)		**XTB3+8BFZ**	Screw, Input, Output and Speaker Terminal M'tg
(59)		XSB26+5FZ	Screw, Separated Switch & Stopper M'tg
(60)		**XTB4+8BFN**	Screw, Cabinet M'tg
(61)		**XTB3+8BFN**	Screw, Bottom Board M'tg
(62)		**XSN3+6BVS**	Screw, Voltage Adjuster & DIN Socket M'tg
(63)		**XWA3BFZ**	Washer, Spring
(64)		**XNG3BS**	Nut, Terminal Strip M'tg
		PACKING PARTS	
P1		SPP597	Polyethylene Bag
P2		SPS1721	Pad, Left Side
P3		SPS1723	Pad, Right Side
P4		SPG1983	Carton Box
P4 [XGF] only		SPG1985	Carton Box
P5		SQF10215	Instructions Book, Printed Matter

■ CHANGE OF PARTS LIST

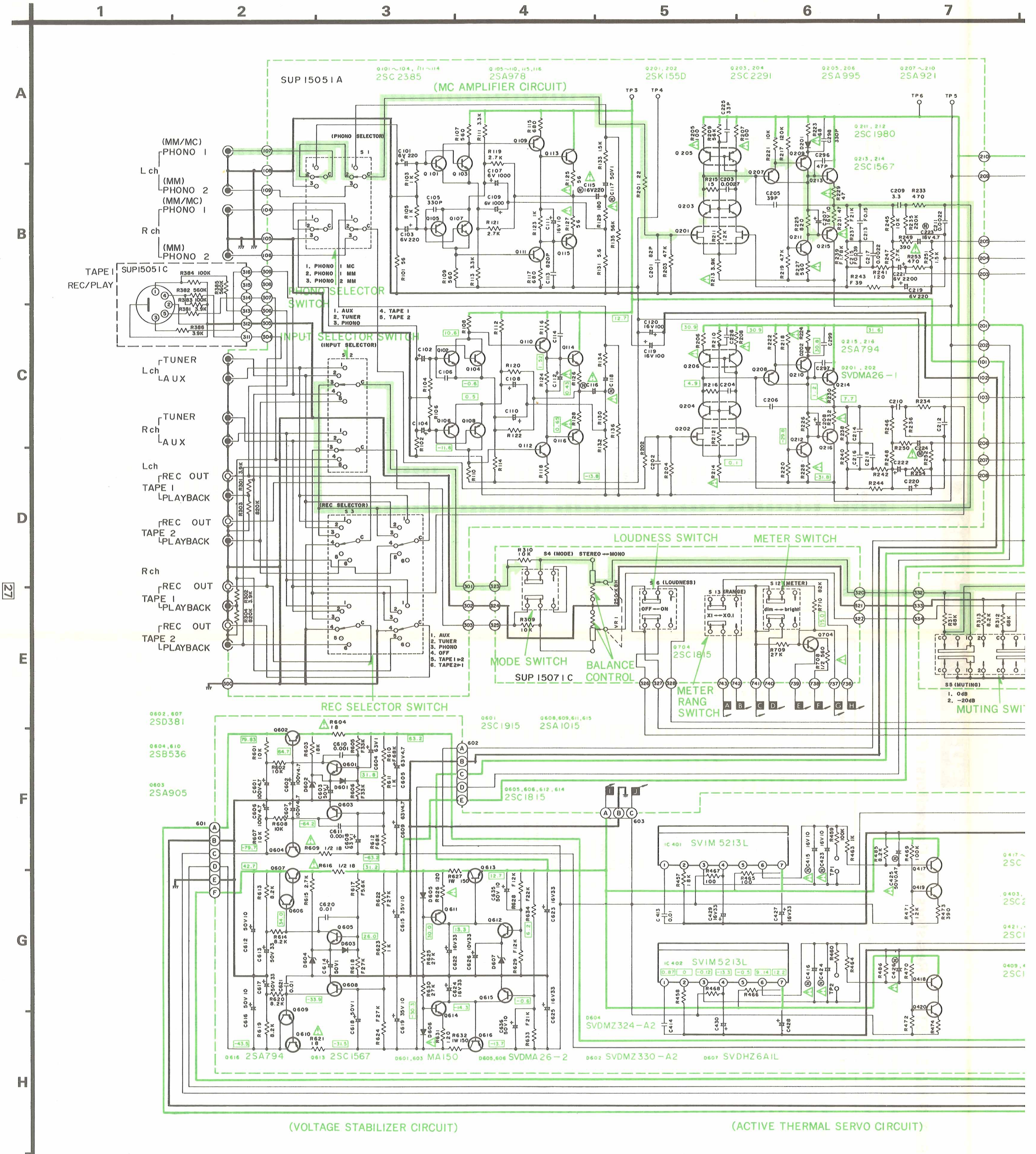
SU-8099K

(D), (DG), (EB), (XSW), (XE), (X), (XA), (XGH)

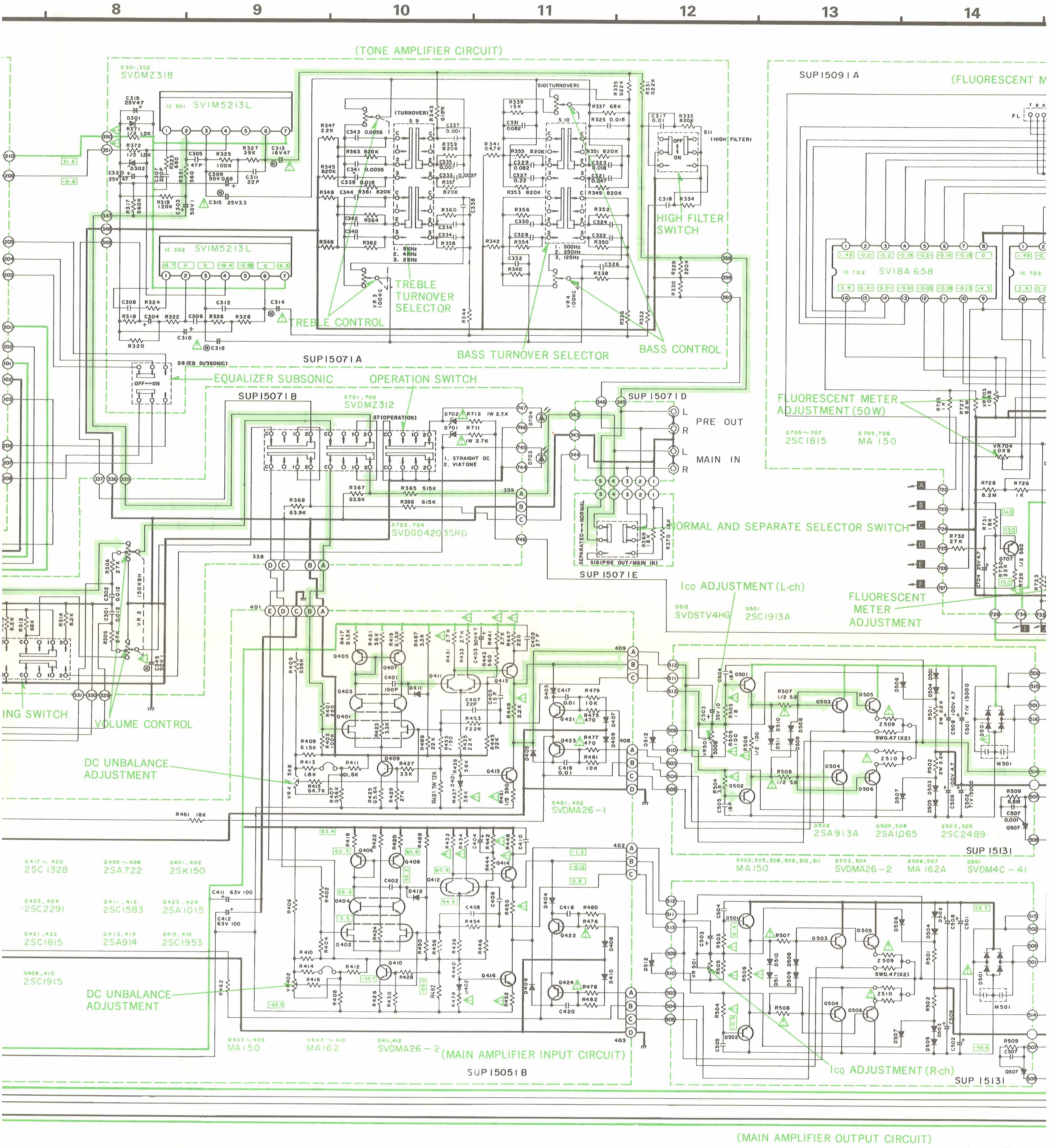
Note: This parts list included only the changes of the model SU-8099 parts list.

Ref. No.	Change of Part No.		Part Name & Description
	SU-8099 →	SU-8099K	
		TRANSFORMER	
T1	SLT5S35	SLT5S35	Transformer, Power Source (Except Products for [XE])
		SLT5S37 [XE]	Transformer, Power Source (Only Products for [XE])
		CABINET and CHASSIS PARTS	
1	SBN777	SBN809	Knob, Volume Control
2	SBN771	SBN805	Knob, Balance, Turnover, Treble & Bass Control
3	SBN769	SBN803	Knob, Phono, Recording, Input & Speakers Selector
4	SGWU8099M	SGWU8099KD	Panel, Front Ass'y (Black)
6	SBC197	SBC197-1	Button, Push Switches
10	SBD19	SBD19-1	Knob, Lever Switches
18	SKA10070	SKA10071	Cabinet, Ass'y (Except Products for [XE])
		SKA10073 [XE]	Cabinet (Only Products for [XE])
24	SHR127	SHR127	Bushing, AC Cord (Except Products for [XE])
		SHR129 [XE]	Bushing, AC Cord (Only Products for [XE])
25	SJA97	SJA97	AC Cord (Except Products for [XE] and [XSW])
		RJA45ZC [XE]	AC Cord (Only Products for [XE])
	SJA111 [XSW]	SJA111 [XSW]	AC Cord (Only Products for [XSW])
35	SGP1310-1A [D, XSW]	SGPU8099KD [D, DG, XGH, EB, XSW]	Rear Panel, SGP1310-1A with Name Plate (SGT20070) (Except Products for [XE], [X] and [XA])
	SGPU8099D	SGPU8099KE [XE]	Rear Panel, SGP1310-1A with Name Plate (SGT20051) (Only Products for [XE])
		SGPU8099KX [X, XA]	Rear Panel, SGP1310-2A with Name Plate (SGT20090) (Only Products for [X] and [XA])
43	SJR205	Deletion [X, XA] only	Terminal Strip (Deletion Only Products for [X] and [XA])
44	Addition	SJSA66-1 [X, XA] only	Socket, AC Outlet (Addition Only Products for [X] and [XA])
45	Addition	SUW1475 [XE] only	Metal Fitting (Addition Only Products for [XE])
46	Addition	SGS491-1 [XE] only	Ventilation (Addition Only Products for [XE])
		SCREWS	
㊿	XTB3+8BFN	XTB3+8BFZ	Screw, Front Panel M'tg (Black)
(60)	XTB4+8BFN	XTB4+8BFZ	Screw, Cabinet M'tg (Black)
(64)	XNG3BS	Deletion [X, XA] only	Nut (Deletion Only Products for [X] and [XA])
(65)	Addition	XSS3+6BVS [XE] only	Screw, Ventilation M'tg (Addition only Products for [XE])
(66)	Addition	XSN3+6BVS [XE] only	Screw, Ventilation M'tg (Addition Only Products for [XE])
		ACCESSORIES	
A1	Addition	SJP5213-1 [X, XA] only	Plug Adapter (Addition Only Products for [X] and [XA])
A2	Addition	SJP5215 [X, XA] only	Plug Adapter (Addition Only Products for [X] and [XA])
		PACKING PARTS	
P4	SPG1983	SPG1999	Carton Box
	SPG1985 [XGF]		

■ SCHEMATIC DIAGRAM ...... MODEL SU-8099 / SU-8099K

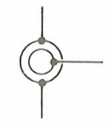

1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
SUP 15051 A
(MC AMPLIFIER CIRCUIT)
Q101～104, 111～114 2SC2385
Q105～110, 115, 116 2SA978
Q201, 202 2SK155D
Q203, 204 2SC2291
Q205, 206 2SA995
Q207～210 2SA921
Q211, 212 2SC1980
Q213, 214 2SC1567
Q215, 214 2SA794
D201, 202 SVDMA26－1
TP3
TP4
TP5
TP6
(MM/MC) PHONO 1
L ch
(MM) PHONO 2
(MM/MC) PHONO 1
R ch
(MM) PHONO 2
TAPE 1 REC/PLAY
SUP15051C
(PHONO SELECTOR)
1. PHONO 1 MC
2. PHONO 1 MM
3. PHONO 2 MM
PHONO SELECTOR SWITCH
(INPUT SELECTOR)
1. AUX
2. TUNER
3. PHONO
4. TAPE 1
5. TAPE 2
INPUT SELECTOR SWITCH
L ch TUNER
AUX
R ch TUNER
AUX
L ch REC OUT TAPE 1 PLAYBACK
REC OUT TAPE 2 PLAYBACK
R ch REC OUT TAPE 1 PLAYBACK
REC OUT TAPE 2 PLAYBACK
(REC SELECTOR)
1. AUX
2. TUNER
3. PHONO
4. OFF
5. TAPE 1⇒2
6. TAPE 2⇒1
REC SELECTOR SWITCH
LOUDNESS SWITCH
METER SWITCH
S4 (MODE) STEREO ⇔ MONO
S6 (LOUDNESS) OFF ⇔ ON
S13 (RANGE) X1 ⇔ X0.1
S12 (METER) dim ⇔ bright
MODE SWITCH
BALANCE CONTROL
SUP 15071 C
Q704 2SC1815
METER RANG SWITCH
S5 (MUTING)
1. 0dB
2. －20dB
MUTING SWI
Q602, 607 2SD381
Q604, 610 2SB536
Q603 2SA905
Q601 2SC1915
Q608, 609, 611, 615 2SA1015
Q605, 606, 612, 614 2SC1815
Q616 2SA794
Q613 2SC1567
D601, 603 MA150
D605, 606 SVDMA26－2
D602 SVDMZ330－A2
D607 SVDHZ6A1L
D604 SVDMZ324－A2
IC401 SVIM5213L
IC402 SVIM5213L
(VOLTAGE STABILIZER CIRCUIT)
(ACTIVE THERMAL SERVO CIRCUIT)

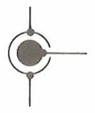
Ref. No.	Production Part	Standard Part
Q405, 406, 407, 408	2SA722	2SA902S-F

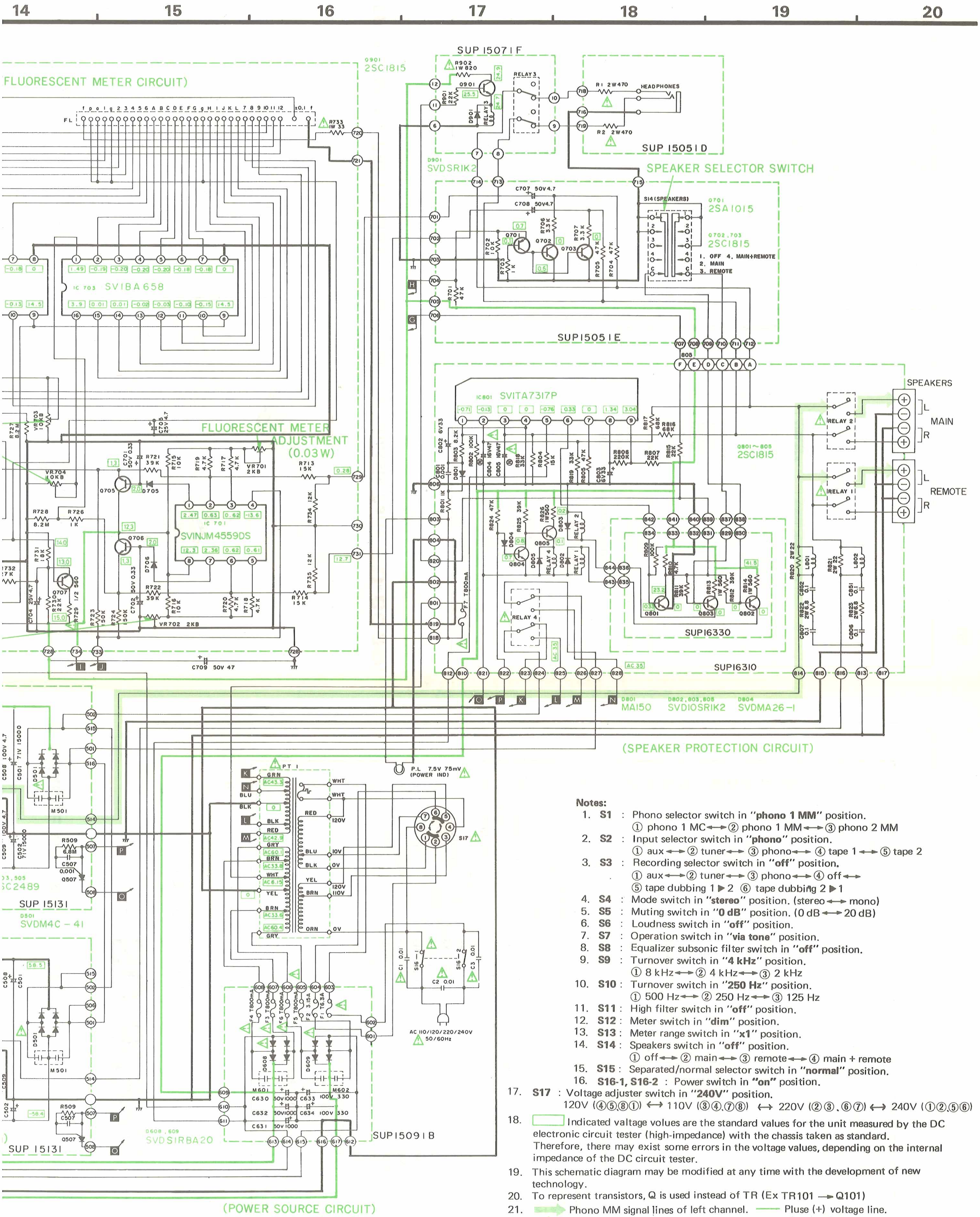

8
9
10
11
12
13
14
(TONE AMPLIFIER CIRCUIT)
D301, 302 SVDMZ318
IC 301 SVIM5213L
IC 302 SVIM5213L
(TURNOVER) S9
S10 (TURNOVER)
S11 (HIGH FILTER)
HIGH FILTER SWITCH
1. 8KHz 2. 4KHz 3. 2KHz
1. 500Hz 2. 250Hz 3. 125Hz
TREBLE TURNOVER SELECTOR
TREBLE CONTROL
BASS TURNOVER SELECTOR
BASS CONTROL
SUP15071A
S8 (EQ SUBSONIC)
OFF ⟷ ON
EQUALIZER SUBSONIC
OPERATION SWITCH
SUP15071B
D701, 702 SVDMZ312
S7 (OPERATION)
1. STRAIGHT DC 2. VIATONE
D703, 704 SVDGD4203SRD
SUP15071D
PRE OUT
MAIN IN
L
R
SEPARATED — NORMAL
S15 (PRE OUT/MAIN IN)
NORMAL AND SEPARATE SELECTOR SWITCH
SUP15071E
SUP15091A
(FLUORESCENT M
IC 702 SVIBA658
IC 703
FLUORESCENT METER ADJUSTMENT (50W)
Q705 ~ 707 2SC1815
D705, 706 MA150
FLUORESCENT METER ADJUSTMENT
ICQ ADJUSTMENT (L-ch)
D501 SVDSTV4HG
Q501 2SC1913A
ING SWITCH
VOLUME CONTROL
VR2 150KBH
DC UNBALANCE ADJUSTMENT
D401, 402 SVDMA26-1
Q502 2SA913A
Q504, 506 2SA1065
Q503, 505 2SC2489
SUP15131
D502, 505, 508, 509, 510, 511 MA150
D503, 504 SVDMA26-2
D506, 507 MA162A
D501 SVDM4C-41
Q417 ~ 420 2SC1328
Q405 ~ 408 2SA722
Q401, 402 2SK150
Q403, 404 2SC2291
Q411, 412 2SC1583
Q423, 424 2SA1015
Q421, 422 2SC1815
Q413, 414 2SA914
Q415, 416 2SC1953
Q409, 410 2SC1915
DC UNBALANCE ADJUSTMENT
D403 ~ 406 MA150
D407 ~ 410 MA162
D411, 412 SVDMA26-2
(MAIN AMPLIFIER INPUT CIRCUIT)
SUP15051B
ICQ ADJUSTMENT (R-ch)
SUP15131
(MAIN AMPLIFIER OUTPUT CIRCUIT)

● Power Source

AC 110/120/220/240V 50/60Hz


Jack (Open Type) : Whether plug is inserted or not, jack is kept open.

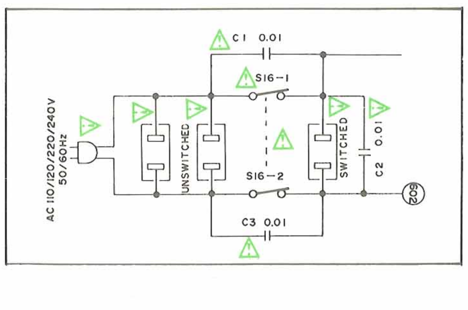

Jack (Short Type) : When plug is not inserted, jack is kept in shorted condition.


14
15
16
17
18
19
20
FLUORESCENT METER CIRCUIT)
FLUORESCENT METER ADJUSTMENT (0.03W)
IC 703 SV1BA658
IC 701 SVINJM4559DS
VR701 2KB
VR702 2KB
VR704 10KB
SUP 15071F
RELAY 3
HEADPHONES
SUP 15051D
SPEAKER SELECTOR SWITCH
S14 (SPEAKERS)
1. OFF 4. MAIN+REMOTE
2. MAIN
3. REMOTE
Q701 2SA1015
Q702,703 2SC1815
D901 SVDSRIK2
Q901 2SC1815
SUP15051E
IC801 SVITA7317P
Q801~805 2SC1815
SPEAKERS
MAIN
REMOTE
RELAY 1
RELAY 2
RELAY 4
SUP16330
SUP16310
D801 MA150
D802,803,805 SVD10SRIK2
D804 SVDMA26-1
(SPEAKER PROTECTION CIRCUIT)
PT 1
P.L 7.5V 75mA (POWER IND)
S17
AC 110/120/220/240V 50/60Hz
SUP 15131
D501 SVDM4C-41
Q503,505 2SC2489
D608,609 SVDSIRBA20
SUP15091B
(POWER SOURCE CIRCUIT)

Notes:

1. **S1** : Phono selector switch in "**phono 1 MM**" position.
   ① phono 1 MC ↔ ② phono 1 MM ↔ ③ phono 2 MM
2. **S2** : Input selector switch in "**phono**" position.
   ① aux ↔ ② tuner ↔ ③ phono ↔ ④ tape 1 ↔ ⑤ tape 2
3. **S3** : Recording selector switch in "**off**" position.
   ① aux ↔ ② tuner ↔ ③ phono ↔ ④ off ↔
   ⑤ tape dubbing 1 ▶ 2 ⑥ tape dubbing 2 ▶ 1
4. **S4** : Mode switch in "**stereo**" position. (stereo ↔ mono)
5. **S5** : Muting switch in "**0 dB**" position. (0 dB ↔ 20 dB)
6. **S6** : Loudness switch in "**off**" position.
7. **S7** : Operation switch in "**via tone**" position.
8. **S8** : Equalizer subsonic filter switch in "**off**" position.
9. **S9** : Turnover switch in "**4 kHz**" position.
   ① 8 kHz ↔ ② 4 kHz ↔ ③ 2 kHz
10. **S10** : Turnover switch in "**250 Hz**" position.
    ① 500 Hz ↔ ② 250 Hz ↔ ③ 125 Hz
11. **S11** : High filter switch in "**off**" position.
12. **S12** : Meter switch in "**dim**" position.
13. **S13** : Meter range switch in "**x1**" position.
14. **S14** : Speakers switch in "**off**" position.
    ① off ↔ ② main ↔ ③ remote ↔ ④ main + remote
15. **S15** : Separated/normal selector switch in "**normal**" position.
16. **S16-1, S16-2** : Power switch in "**on**" position.
17. **S17** : Voltage adjuster switch in "**240V**" position.
    120V (④⑤,⑧①) ↔ 110V (③④,⑦⑧) ↔ 220V (②③,⑥⑦) ↔ 240V (①②,⑤⑥)
18. ☐ Indicated valtage volues are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
19. This schematic diagram may be modified at any time with the development of new technology.
20. To represent transistors, Q is used instead of TR (Ex TR101 → Q101)
21. ➡ Phono MM signal lines of left channel. —— Pluse (+) voltage line.
22. ⚠ indicates that only parts specified by the manufacturer be used for sagety.

• Power Source Circuit (Products for [X] and [XA]).


C1 0.01
S16-1
S16-2
C2 0.01
C3 0.01
UNSWITCHED
SWITCHED
AC 110/120/220/240V 50/60Hz
608

■ REPLACEMENT PARTS LIST ...... Resistors and Capacitorst Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. ⚠ indicates that only parts specified by the manufacturer be used for sefety.

Ref. No.		Part No.	Part Name & Description
		RESISTORS	
R1, 2		**ERG2ANJ471**	Metal Oxide, 470Ω, 2W, ± 5%
R101, 102		**ERD25TJ560**	Carbon, 56Ω, 1/4W, ± 5%
R103, 104		**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R105, 106		**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R107, 108		ERO25CKG5600	Metal Film, 560Ω, 1/4W, ± 2%
R109, 110		ERO25CKG5600	Metal Film, 560Ω, 1/4W, ± 2%
R111, 112		ERO25CKG3301	Metal Film, 3.3kΩ, 1/4W, ± 2%
R113, 114		ERO25CKG3301	Metal Film, 3.3kΩ, 1/4W, ± 2%
R115, 116		ERO25CKG6800	Metal Film, 680Ω, 1/4W, ± 2%
R117, 118		ERO25CKG6800	Metal Film, 680Ω, 1/4W, ± 2%
R119, 120		ERO25CKG2701	Metal Film, 2.7kΩ, 1/4W, ± 2%
R121, 122		ERO25CKG2701	Metal Film, 2.7kΩ, 1/4W, ± 2%
R123, 124		**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R125, 126	⚠	ERD25FJ560	Carbon, 56Ω, 1/4W, ± 5%
R127, 128	⚠	ERD25FJ560	Carbon, 56Ω, 1/4W, ± 5%
R129, 130		ERO25CKG1800	Metal Film, 180Ω, 1/4W, ± 2%
R131, 132		**ERD25TJ5R6**	Carbon, 5.6Ω, 1/4W, ± 5%
R133, 134		**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%
R135, 136		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%
R201, 202		**ERD25TJ220**	Carbon, 22Ω, 1/4W, ± 5%
R203, 204		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R205, 206	⚠	ERD25FJ101	Carbon, 100Ω, 1/4W, ± 5%
R207, 208	⚠	ERD25FJ101	Carbon, 100Ω, 1/4W, ± 5%
R209, 210		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%
R211, 212		**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ± 5%
R213, 214	⚠	ERD25FJ392	Carbon, 3.9kΩ, 1/4W, ± 5%
R215, 216		**ERD25TJ150**	Carbon, 15Ω, 1/4W, ± 5%
R217, 218		**ERD25TJ124**	Carbon, 120kΩ, 1/4W, ± 5%
R219, 220		**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R221, 222		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R223, 224	⚠	ERD25FJ680	Carbon, 68Ω, 1/4W, ± 5%
R225, 226		**ERD25TJ821**	Carbon, 820Ω, 1/4W, ± 5%
R227, 228	⚠	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R229, 230	⚠	ERD25FJ470	Carbon, 47Ω, 1/4W, ± 5%
R231, 232	⚠	ERD25FJ470	Carbon, 47Ω, 1/4W, ± 5%
R233, 234		**ERD25TJ471**	Carbon, 470Ω, 1/4W, ± 5%
R235, 236		**ERD25TJ224**	Carbon, 220kΩ, 1/4W, ± 5%
R237, 238		ERO25CKF2102	Metal Film, 21kΩ, 1/4W, ± 1%
R239, 240		ERO25CKF1781	Metal Film, 1.78kΩ, 1/4W, ± 1%
R241, 242		**ERD25TJ121**	Carbon, 120Ω, 1/4W, ± 5%
R243, 244		ERO25CKF39R0	Metal Film, 39Ω, 1/4W, ± 1%
R245, 246		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R247, 248		**ERD25TJ272**	Carbon, 2.7kΩ, 1/4W, ± 5%
R249, 250		**ERD25TJ391**	Carbon, 390Ω, 1/4W, ± 5%
R251, 252		**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%
R253, 254		**ERD25TJ471**	Carbon, 470Ω, 1/4W, ± 5%
R301, 302		**ERD25TJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R303, 304		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R305, 306		**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ± 5%
R309, 310		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R311, 312		**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ± 5%
R313, 314		**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ± 5%
R317, 318		**ERD25TJ564**	Carbon, 560kΩ, 1/4W, ± 5%
R319, 320		**ERD25TJ124**	Carbon, 120kΩ, 1/4W, ± 5%
R321, 322		**ERD25TJ561**	Carbon, 560Ω, 1/4W, ± 5%
R323, 324		**ERD25TJ681**	Carbon, 680Ω, 1/4W, ± 5%
R325, 326		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R327, 328		**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ± 5%
R329, 330		**ERD25TJ224**	Carbon, 220kΩ, 1/4W, ± 5%
R331, 332		ERO25CKG2201	Metal Film, 2.2kΩ, 1/4W, ± 2%
R333, 334		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R335, 336		ERO25CKG2202	Metal Film, 22kΩ, 1/4W, ± 2%
R337, 338		**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ± 5%
R339, 340		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%
R341, 342		ERO25CKG4701	Metal Film, 4.7kΩ, 1/4W, ± 2%
R343, 344		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R345, 346		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R347, 348		**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R349, 350		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R351, 352		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R353, 354		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R355, 356		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R357, 358		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R359, 360		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R361, 362		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R363, 364		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R365, 366		ERO25CKG1502	Metal Film, 15kΩ, 1/4W, ± 2%
R367, 368		ERO25CKG3901	Metal Film, 3.9kΩ, 1/4W, ± 2%
R369, 370		**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ± 5%
R371, 372	⚠	ERD50FJ122	Carbon, 1.2kΩ, 1/2W, ± 5%
R381		**ERD25TJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R382		**ERD25TJ564**	Carbon, 560kΩ, 1/4W, ± 5%
R383, 384		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R385		**ERD25TJ564**	Carbon, 560kΩ, 1/4W, ± 5%
R386		**ERD25TJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R401, 402		**ERD25TJ221**	Carbon, 220Ω, 1/4W, ± 5%
R403, 404		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R405, 406		ERO25CKG5602	Metal Film, 56kΩ, 1/4W, ± 2%
R407, 408		ERO25CKG5602	Metal Film, 56kΩ, 1/4W, ± 2%
R409, 410		ERO25CKG1501	Metal Film, 1.5kΩ, 1/3W, ± 2%
R411, 412		ERO25CKG1501	Metal Film, 1.5kΩ, 1/4W, ± 2%
R413, 414		**ERD25TJ182**	Carbon, 1.8kΩ, 1/4W, ± 5%
R415, 416		ERO25CKG4701	Metal Film, 4.7kΩ, 1/4W, ± 2%
R417, 418		ERO25CKG1501	Metal Film, 1.5kΩ, 1/4W, ± 2%
R419, 420		ERO25CKG1501	Metal Film, 1.5kΩ, 1/4W, ± 2%
R421, 422		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%
R423, 424		**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ± 5%
R425, 426		ERO25CKG5601	Metal Film, 5.6kΩ, 1/4W, ± 2%
R427, 428		**ERD25TJ333**	Carbon, 33kΩ, 1/4W, ± 5%
R429, 430		**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ± 5%
R431, 432	⚠	ERD25FJ272	Carbon, 2.7kΩ, 1/4W, ± 5%
R433, 434	⚠	ERD25FJ272	Carbon, 2.7kΩ, 1/4W, ± 5%
R435, 436		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R437, 438	⚠	ERD25FJ392	Carbon, 3.9kΩ, 1/4W, ± 5%
R439, 440		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%
R441, 442	⚠	ERD25FJ272	Carbon, 2.7kΩ, 1/4W, ± 5%
R443, 444		**ERD25TJ561**	Carbon, 560Ω, 1/4W, ± 5%
R445, 446		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R447, 448	⚠	ERD25FJ221	Carbon, 220Ω, 1/4W, ± 5%
R449, 450	⚠	ERD25FJ222	Carbon, 2.2kΩ, 1/4W, ± 5%
R451, 452	⚠	ERQ12HJ391	Fuse Type Metallic, 390Ω, 1/2W, ± 5%
R453, 454		ERO25CKF2202	Metal Film, 22kΩ, 1/4W, ± 1%
R455, 456		ERO25CKF1500	Metal Film, 1.5kΩ, 1/4W, ± 1%
R457, 458		**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ± 5%
R459, 460		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R461, 462		**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ± 5%
R463, 464		**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R465, 466		**ERD25TJ101**	Carbon, 100Ω, 1/4W, ± 5%
R467, 468		**ERD25TJ101**	Carbon, 100Ω, 1/4W, ± 5%
R469, 470		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R471, 472		**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ± 5%
R473, 474		**ERD25TJ391**	Carbon, 390Ω, 1/4W, ± 5%
R475, 476	⚠	ERD25FJ471	Carbon, 470Ω, 1/4W, ± 5%
R477, 478	⚠	ERD25FJ471	Carbon, 470Ω, 1/4W, ± 5%
R479, 480		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R481, 482		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R485, 486		**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ± 5%
R487, 488		**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ± 5%
R489, 490		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R491, 492		**ERG1ANJ123**	Metal Oxide, 12kΩ, 1W, ± 5%
R501, 502 (X2)		**ERG2ANJ222**	Metal Oxide, 2.2kΩ, 2W, ± 5%
R503 (X2)	⚠	ERQ12HJ180	Fuse Type Metallic, 18Ω, 1/2W, ± 5%
R504 (X2)	⚠	ERD25FJ3R9	Carbon, 3.9Ω, 1/4W, ± 5%
R505 (X2)	⚠	ERD25FJ101	Carbon, 100Ω, 1/4W, ± 5%
R506 (X2)	⚠	ERQ12HJ101	Fuse Type Metallic, 100Ω, 1/2W, ± 5%
R507, 508 (X2)	⚠	ERQ12HJ5R6	Fuse Type Metallic, 5.6Ω, 1/2W, ± 5%
R509 (X2)		**ERC14GK685**	Solid, 6.8MΩ, 1/4W, ± 5%
R601, 602		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R603		**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ± 5%
R604	⚠	ERD25FJ180	Carbon, 18Ω, 1/4W, ± 5%
R605, 606		ERO25CKF3302	Metal Film, 33kΩ, 1/4W, ± 1%
R607, 608		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R609	⚠	ERQ12HJ180	Fuse Type Metallic, 18Ω, 1/2W, ± 5%
R610		ERO25CKF6802	Metal Film, 68kΩ, 1/4W, ± 1%
R611		**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R612		ERO25CKF6802	Metal Film, 68kΩ, 1/4W, ± 1%
R613, 614		**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ± 5%
R615		**ERD25TJ272**	Carbon, 2.7kΩ, 1/4W, ± 5%
R616	⚠	ERQ12HJ180	Fuse Type Metallic, 18Ω, 1/2W, ± 5%
R617		ERO25CKF5601	Metal Film, 5.6kΩ, 1/4W, ± 1%
R618		ERO25CKF2702	Metal Film, 27kΩ, 1/4W, ± 1%
R619, 620		**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ± 5%
R621	⚠	ERD25FJ180	Carbon, 18Ω, 1/4W, ± 5%
R622		ERO25CKF2702	Metal Film, 27kΩ, 1/4W, ± 1%
R623		**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R624		ERO25CKF2702	Metal Film, 27kΩ, 1/4W, ± 1%
R625		**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ± 5%
R626	⚠	ERD25FJ121	Carbon, 120Ω, 1/4W, ± 5%
R627		**ERG1ANJ151**	Metal Oxide, 150Ω, 1W, ± 5%
R628, 629		ERO25CKF1202	Metal Film, 12kΩ, 1/4W, ± 1%
R630		**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ± 5%
R631	⚠	ERD25FJ121	Carbon, 120Ω, 1/4W, ± 5%
R632		**ERG1ANJ151**	Metal Oxide, 150Ω, 1W, ± 5%
R633		ERO25CKF2102	Metal Film, 21kΩ, 1/4W, ± 1%
R634		ERO25CKF2202	Metal Film, 22kΩ, 1/4W, ± 1%
R701		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R702		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R703		**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R704, 705		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R706, 707		**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ± 5%
R708	⚠	ERD50FJ561	Carbon, 560Ω, 1/2W, ± 5%
R709		**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ± 5%
R710		**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ± 5%
R711, 712		**ERG1ANJ272**	Metal Oxide, 2.7kΩ, 1W, ± 5%
R713, 714		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%
R715, 716		**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R717, 718		**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R719, 720		**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R721, 722		**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ± 5%
R723, 724		**ERD25TJ154**	Carbon, 150kΩ, 1/4W, ± 5%
R725, 726		**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R727, 728		**ERC14GK825**	Solid, 8.2MΩ, 1/4W, ±10%
R729	⚠	ERD50FJ561	Carbon, 560Ω, 1/2W, ± 5%
R730		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R731		**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ± 5%
R732		**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ± 5%
R733		**ERG1ANJ330**	Metal Oxide, 33Ω, 1W, ± 5%
R734, 735		**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ± 5%
R801		**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R802		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R803		**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ± 5%
R804		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%
R805		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R806		**ERD25TJ224**	Carbon, 220kΩ, 1/4W, ± 5%
R807		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R809		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R810		**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R811, 812		**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ± 5%
R813, 814		**ERG1ANJ561**	Metal Oxide, 560Ω, 1W, ± 5%
R815		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R816, 817		**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ± 5%
R818, 819		**ERD25TJ333**	Carbon, 33kΩ, 1/4W, ± 5%
R820, 821		**ERG2ANJ220**	Metal Oxide, 22Ω, 2W, ± 5%
R822, 823		**ERX2ANJ6R8**	Metal Film, 6.8Ω, 2W, ± 5%
R824		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R825		**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ± 5%
R826		**ERG1ANJ561**	Carbon, 560Ω, 1W, ± 5%
R901		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R902		**ERG1ANJ821**	Metal Oxide, 820Ω, 1W, ± 5%
		CAPACITORS	
C1, 2, 3	⚠	ECKDHS103SE	Ceramic, 0.01μF, 400VAC, $^{+50}_{-20}$%
C101, 102		**ECEA1AS221**	Electrolytic, 220μF, 10V
C103, 104		**ECEA1AS221**	Electrolytic, 220μF, 10V
C105, 106		ECKD1H331KB	Ceramic, 330pF, 50V, ±10%
C107, 108		**ECEA0JS102**	Electrolytic, 1000μF, 6.3V
C109, 110		**ECEA0JS102**	Electrolytic, 1000μF, 6.3V
C111, 112		**ECEA1HS100**	Electrolytic, 10μF, 50V
C113, 114		ECKD1H821KB	Ceramic, 820pF, 50V, ±10%
C115, 116	⚠	**ECEA16N220**	Non-Polar Electrolytic, 220μF, 16V
C117, 118	⚠	**ECEA50N1**	Non-Polar Electrolytic, 1μF, 50V
C119, 120		**ECEA1ES101**	Electrolytic, 100μF, 25V
C201, 202		ECCD1H820K	Ceramic, 82pF, 50V, ±10%
C203, 204		ECQM1H272KZ	Polyester, 0.0027μF, 50V, ±10%
C205, 206		ECCD1H390K	Ceramic, 39pF, 50V, ±10%
C207, 208		**ECEA1HS100**	Electrolytic, 10μF, 50V
C209, 210		ECQE1335KZ	Polyester, 3.3μF, 100V, ±10%
C211, 212		ECQM1H222JZ	Polyester, 0.0022μF, 50V, ± 5%
C213, 214		ECQP1154FZ	Polypropylene, 0.15μF, 100V, ± 1%
C215, 216		ECQP1393FZ	Polypropylene, 0.039μF, 100V, ± 1%
C217, 218		ECQM1H222JZ	Polyester, 0.0022μF, 50V, ± 5%
C219, 220		**ECEA1AS221**	Electrolytic, 220μF, 10V
C221, 222		**ECEA0JS222**	Electrolytic, 2200μF, 6.3V
C223, 224	⚠	**ECEA16N4R7**	Non-Polar Electrolytic, 4.7μF, 16V
C225, 226		ECCD1H330K	Ceramic, 33pF, 50V, ±10%
C296, 297		ECCD1H470K	Ceramic, 47pF, 50V, ±10%
C298, 299		ECKD1H331KB	Ceramic, 330pF, 50V, ±10%
C301, 302		ECQM1H123KZ	Polyester, 0.01μF, 50V, ±10%
C303, 304		**ECEA50M1R**	Electrolytic, 1μF, 50V
C305, 306		ECCD1H470K	Ceramic, 47pF, 50V, ±10%
C307, 308		ECCD1H221K	Ceramic, 220pF, 50V, ±10%
C309, 310		**ECEA50MR68R**	Electrolytic, 0.68μF, 50V
C311, 312		ECCD1H220K	Ceramic, 22pF, 50V, ±10%
C313, 314	⚠	**ECEA16N47**	Non-Polar Electrolytic, 47μF, 16V
C315, 316	⚠	**ECEA25N3R3**	Non-Polar Electrolytic, 3.3μF, 25V
C317, 318		ECQM1H103JZ	Polyester, 0.01μF, 50V, ± 5%
C319, 320		**ECEA1ES470**	Electrolytic, 47μF, 25V
C321, 322		ECQM1H473JZ	Polyester, 0.047μF, 50V, ± 5%
C323, 324		ECQM1H183JZ	Polyester, 0.018μF, 50V, ± 5%
C325, 326		ECQM1H183JZ	Polyester, 0.018μF, 50V, ± 5%
C327, 328		ECQM1H224JZ	Polyester, 0.22μF, 50V, ± 5%
C329, 330		ECQM1H823JZ	Polyester, 0.082μF, 50V, ± 5%
C331, 332		ECQM1H823JZ	Polyester, 0.082μF, 50V, ± 5%
C333, 334		ECQM1H272JZ	Polyester, 0.0027μF, 50V, ± 5%
C335, 336		ECQM1H102JZ	Polyester, 0.001μF, 50V, ± 5%
C337, 338		ECQM1H102JZ	Polyester, 0.001μF, 50V, ± 5%
C339, 340		ECQM1H183JZ	Polyester, 0.018μF, 50V, ± 5%
C341, 342		ECQM1H562JZ	Polyester, 0.0056μF, 50V, ± 5%
C343, 344		ECQM1H562JZ	Polyester, 0.0056μF, 50V, ± 5%
C345	⚠	**ECEA50N1**	Non-Polar Electrolytic, 1μF, 50V
C401, 402		ECCD1H151K	Ceramic, 150pF, 50V, ±10%
C403, 404		**ECEA1HS470**	Electrolytic, 47μF, 50V
C405, 406		ECCD1H150K	Ceramic, 15pF, 50V, ±10%
C407, 408		ECCD1H220K	Ceramic, 22pF, 50V, ±10%
C409, 410		ECCD1H270K	Ceramic, 27pF, 50V, ±10%
C411, 412		**ECEA1JS101**	Electrolytic, 100μF, 63V
C413, 414		ECKD1H103MD	Ceramic, 0.01μF, 50V, ±20%
C415, 416	⚠	**ECEA16N10**	Non-Polar Electrolytic, 10μF, 16V
C417, 418		ECKD1H103MD	Ceramic, 0.01μF, 50V, ±20%
C419, 420		ECKD1H103MD	Ceramic, 0.01μF, 50V, ±20%
C423, 424	⚠	**ECEA16N10**	Non-Polar Electrolytic, 10μF, 16V
C425, 426	⚠	**ECEA50NR47**	Non-Polar Electrolytic, 0.47μF, 50V
C427, 428		**ECEA1CS330**	Electrolytic, 33μF, 16V
C429, 430		**ECEA1CS330**	Electrolytic, 33μF, 16V
C501, 502 (X2)		ECEM71R153U	Electrolytic, 15000μF, 71V
C503 (X2)		**ECEA1HS100**	Electrolytic, 10μF, 50V
C504, 505 (X2)		ECCD2H180K	Ceramic, 18pF, 500V, ±10%
C507 (X2)		ECKD1H102MD	Ceramic, 0.001μF, 50V, ±20%
C508, 509 (X2)		**ECEA2AS4R7**	Electrolytic, 4.7μF, 100V
C601, 602		**ECEA2AS4R7**	Electrolytic, 4.7μF, 100V
C603		**ECEA50Z1**	Electrolytic, 1μF, 50V
C604		**ECEA2AS010**	Electrolytic, 1μF, 100V
C605		**ECEA1JS4R7**	Electrolytic, 4.7μF, 63V
C606, 607		**ECEA1JS4R7**	Electrolytic, 4.7μF, 63V
C608		**ECEA2AS010**	Electrolytic, 1μF, 100V
C609		**ECEA1JS4R7**	Electrolytic, 4.7μF, 63V
C610, 611		ECKD1H102MD	Ceramic, 0.001μF, 50V, ±20%
C612		**ECEA1HS100**	Electrolytic, 10μF, 50V
C613		**ECEA1JS330**	Electrolytic, 33μF 63V
C614		**ECEA50Z1**	Electrolytic, 1μF, 50V
C615, 616		**ECEA1HS100**	Electrolytic, 10μF, 50V
C617		**ECEA1JS330**	Electrolytic, 33μF, 63V
C618		**ECEA50Z1**	Electrolytic, 1μF, 50V
C619		**ECEA1HS100**	Electrolytic, 10μF, 50V
C620, 621		ECKD1H103MD	Ceramic, 0.01μF, 50V, ±20%
C622, 623		**ECEA1CS330**	Electrolytic, 33μF, 16V
C624, 625		**ECEA1CS330**	Electrolytic, 33μF, 16V
C626		**ECEA1CS330**	Electrolytic, 33μF, 16V
C630, 631		**ECEA1HS102**	Electrolytic, 1000μF, 50V
C632		**ECEA1HS102**	Electrolytic, 1000μF, 50V
C633, 634		**ECEA2AS331**	Electrolytic, 330μF, 100V
C635, 636		**ECEA1HS100**	Electrolytic, 10μF, 50V
C701, 702		ECEA50ZR33	Electrolytic, 0.33μF, 50V
C704, 705		**ECEA25Z4R7**	Electrolytic, 4.7μF, 25V
C707, 708		**ECEA1JS4R7**	Electrolytic, 4.7μF, 63V
C709		**ECEA1HS470**	Electrolytic, 47μF, 50V
C801		ECKD1H102MD	Ceramic, 0.001μF, 50V, ±20%
C802		**ECEA25Z4R7**	Electrolytic, 4.7μF, 25V
C803		**ECEA1CS330**	Electrolytic, 33μF, 16V
C804, 805	⚠	**ECEA16N47**	Non-Polar Electrolytic, 47μF, 16V
C806, 807		ECQM1H104KZ	Polyester, 0.1μF, 50V, ±10%
C851, 852		ECQM1H104KZ	Polyester, 0.1μF, 50V, ±10%

Printed in Japan
79036800 Ⓐ Y.K.